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PETROLEUM.

THE GEOGRAPHY, CHEMISTRY AND GEOLOGY OF MINERAL OILS—A RECORD OF PERSONAL INVESTIGATIONS.

Mineral Oils Allied to Petroleum—Naphthas Produced by the Distillation of Mineral and Organic Substances—Naphtha from Cannel Coal; from Bone; from Caoutchouc; Coal Tar; from Wood; Use of oils Among Various Nations—Saussure and Reichenbach's Experiments—Experiments by Young, in England—the Establishment of the Paraffine Manufacture in Germany—Fish Oils—Benzole.

In commencing a series of somewhat scientific letters upon the subject of petroleum, it will render clearer many subjects of which I propose to treat, if some explanation is given of the nature of mineral oils allied to petroleum, the mode of distilling them, and the different uses made of the various distillates.

The substance now generally known as petroleum was originally called, in the language of chemistry and mineralogy, naphtha. It was thought to be the result of continued gentle heat upon coal or bitumen confined beneath overlying masses of rock, and was regarded as the product of an ordinary distillation of the volatile matters of the coal, from its more solid parts. Accordingly, when various bituminous substances came to be subjected to a destructive disillation to obtain the benzole and other valuable substances contained in them, the general name of naphtha was extended to these stones or rock oils, also. And, finally, it has been so extended as to include almost all inflammable fluids obtained by distillation from organic matters. We shall briefly study the various naphthas under the following heads:

1st. Naphtha from Cannel Coal.
2d. " " Bone.
3d. " " Caoutchouc.
4th. Naphtha from Coal Tar.
5th. " " Wood.

NAPHTHA FROM CANNEL COAL.

In preparing the first, cannel coal is broken into small fragments, and heated in vertical or horizontal iron retorts. The tar passes through a worm made very wide so as not to become choked up by condensation of paraffine, and is received into large tanks. The tar so obtained is subjected to a second distillation, its valuable part is collected for illuminating purposes, the denser is applied to making lubricating oil.

Both portions, however, must be purified before they are adapted to their appropriate uses, and the process employed to effect this purification is the same in both cases. They are alternately treated with concentrated sulphuric acid to remove the highly colored and odorous constituents of the crude distillate, and washed with alkali to remove carbolic and cressylic acids. The alkali serves, moreover, to remove that portion of sulphuric acid which remains suspended in the naphtha and the sulphurous acid produced by the decomposition of the sulphuric acid by the carbon of certain easily decomposed organic matters in the crude distillate. There is another advantage in the treatment of the fluid by alkalies, inasmuch as sulphide of hydrogen, and probably other foetid sulphur compounds are decomposed, and the resulting products removed. In order to improve still further the odor of these oils, and to remove their dark color, it is customary to expose them for several days to the light, by which this object is easily attained.

In order to prepare that portion which was set aside for lubricating purposes, it is run into a tank and heated by a steam pipe to about 150°. This causes the water and mechanically suspended impurities to separate. They are run off at the bottom, and the oil subjected to a further distillation. To each 100 gallons of this distillate, 10 gallons of commercial oil of vitriol are to be added, and the mixture stirred up thoroughly in a large leaden covered tank, provided with a revolving fan. The fluid is then allowed to rest for twelve hours, and the acid is drawn off from the bottom of the tank. Then four gallons of caustic soda are mixed with 100 gallons of this fluid, so as to thoroughly neutralize any acid which has not settled out, and also to remove certain impurities which are capable of combining with it. After a new distillation and purification, the oil is found to be very rich in paraffine, and is used for lubricating purposes, either by itself or mixed with an animal or vegetable oil.

If it be desirable to separate the paraffine, it may be effected by cooling the oil prepared as above stated, down to a temperature of 30° or 40°. The lower the temperature the larger the amount which crystalizes out. The paraffine may be purified further by alternate treatments at about 15° with oil of vitriol and caustic soda. The treatmeuts with acid are to be continued until the latter produces no more blackening. The solid paraffine is then to be washed with caustic soda until all acid is removed, and then with boiling water.

The crude oil obtained by distillation from cannel coal is by no means a homogeneous fluid. If it were so it would have a certain boiling point, and when heated to that point it would pass off gradually in vapor, while a thermometer immersed in the fluid would not manifest any elevation of temperature. But this is not the case, and we find that this crude oil is composed of fluids of about the same degree of volatility as commercial benzole, together with others, which distil at nearly the same temperatures as common coal naptha.

The first are free from solid bodies, and consist of a mixture of fluids composed of carbon and hydrogen combined in various proportions. Such combinations of carbon and hydrogen are called hydrocarbons, and of these hydrocarbons we have here presented to our view three series, which go by the names of the Benzol series, the Olefiant Gas series, and the Alcoholic-Radical series.

The benzole series are of importance as being the class from which aniline, the source of so many brilliant dyes, is obtained; the olefiant series interest us by accounting for the high illuminating power of these oils—olefiant gas being a large constituent of ordinary coal gas; the third series are at present only attractive to chemists. But the methods of obtaining these various bodies are so laborious, involving so many fractional distillations and consecutive treatments with different chemicals, that it is hardly worth while here to do more than to allude to their existence.

BONE NAPHTHA.

In distilling bones for the preparation of animal charcoal, this fluid is obtained in large quantities. It has not yet been chemically examined with any great exactness, but sufficient is known of it to say with certainty that it contains benzole. The odor of bone oil is exceedingly offensive and difficult of removal. Concentrated acids do not suffice to remove it, and it is the costliness of the methods by which the odor is in some degree allayed, which prevents bone naphtha from being used for general purposes.

CAOUTCHOUC NAPHTHA.

When caoutchouc is subjected to destructive distillation, it yields a naphtha whose chemical character has not as yet been satisfactorily ascertained. It is valuable as being one of the best solvents known for india rubber.

NAPHTHA FROM COAL TAR.

This is of especial interest at the present time, on account of its being the source of the benzole used in manufacturing coal tar colors. About a thousand gallons of coal tar are run into a large iron still, and after being twice distilled by steam, let into the interior of the vessel, yield what is termed "rough naphtha." This rough naphtha contains many impurities, and also some nitrogeneous bodies, which impart to it a disgusting smell. In order to remove these the naphtha is mixed first with acid and then with alkali, in an agitator.

Coal tar is a mixture of acid, neutral and basic bodies. The most important acid is carbolic acid, or phenol, which is a colorless fluid, with a powerful odor resembling creosote. It is said to have anaesthetic, disinfectant, and antiseptic properties, and to be an excellent fluid to use in grinding and polishing tools, but all these points are not very satisfactorily established. Of the basic substances, analine is by far the most important; the others, such as pyridine, lutidine, chinoline, etc., have not as yet even been mentioned in common discourse, but the time is speedily coming when they too will be found fraught with as many valuable properties as their better-known congener, aniline.

The number of processes and patents which have been published relating to coal naphtha is immense. There is, as a general rule, an extreme sameness in them. Each inventor uses the processes of his predecessors, with some slight alteration or modification, and patents them as if involving an important discovery. It is true that in some few instances these alterations are very valuable, but the general feeling with which one rises from the perusal of patents connected with coal naphtha is, that there is nothing really new in them. All processes for their purification consist, essentially, of treatments with strong oil of vitriol, followed by alkalies. But the action of the sulphuric acid is by no means generally understood, for if it were we should see far more intelligence displayed in the methods by which it is proposed to get rid of the impurities contained in the coal tar. It is by no means uncommon to hear the workmen, and even those who have the direction of naphtha works, attribute the dark color which naphthas acquire, by contact with oil of vitriol to the latter "precipitating out the tar." The fact is that a carefully distilled naphtha does not contain any tar. The dark color is chiefly due to the removal of the hydrocarbons related to olefiant gas. All bodies like olefiant gas dissolve with a red color sulphuric acid, and the fluid or keeping soon begins to

evolve sulphurous acid and turn dark, sometimes nearly black. These facts are of value in the purification of petroleum, and will go to show the correct method of employing acids in decolorizing the coal oil.

The benzole, which is the most volatile of all the constituents of coal tar, has been used for many purposes. One of them is perfectly familiar to every housekeeper. Benzole is invaluable as a means of removing spots and stains of grease from cotton, woolen, silk and other fabrics; and in consequence of its volatility; it leaves no mark or permanent odor. This property is of importance likewise in many industrial operations, as in removing the fatty matters existing in wool, cleaning hair, fur, feathers from oil, and cleansing gloves and other leathern articles. In order to remove the above matters by means of coal naphtha, the articles, if small, are merely rubbed with it. On the large scale the matters to be operated on are placed in suitable vessels, and the naphtha is run in. After contact for some hours the fluid is run off, and the fabrics are passed through squeezers and submitted to strong pressure to remove the greater portion of the benzole or naphtha. The naphthas which run out are distilled off, so that the greasy matters may be preserved and used for lubricating machinery or other purposes.

WOOD NAPHTHA.

When wood is subjected to destructive distillation, it yields a great number of substances, such as eupione, cedriret, creosote, etc., many of which have varied and important uses. The most volatile of these goes under the name of wood naptha or pyroxillic spirit. It is of great importance to the chemist as being the source from which methylated alcohol, methyl and its many related bodies were originally obtained; but for employment in the arts, it is generally cheaper and more convenient to use a mixture of 90 parts spirit of wine, with 10 parts of purified wood-spirit, which subserve all the purposes of the pure article. As so adulterated, it is extensively employed in the manufacture of varnishes, laquers, etc.

DEVELOPMENT OF THE MANUFACTURE OF NAPHTHA.

It may be interesting at this point, after having detailed the various steps by which the manufacture of naphtha is carried on, to show how the demand for the products of the distillation of coal arose, and what circumstances are likely hereafter to affect it. On the Continent of Europe there is not nearly so many animals slaughtered to supply food to the inhabitants as in our country. It is not customary there to furnish the breakfast table with meat, as is the practice here, and even for the principle meal of the day the majority of the peasant population provide vegetables only.

For this reason there is not near so much fat thrown into the market as in England and America, and consequently it commands a much higher price. The denser the population, the less the quantity of meat which they provide for their tables. We all are familiar with the fact that early pioneers of the Western forests, who could capture abundance of wild game, and whose cattle could fatten on wide prairies, eat little vegetable food. The English with their verdant pastures enjoy an abundance of meat, while the inhabitants of the densely settled lands of Belgium and Holland have far less, and in China the only food to millions is their inexhaustible rice. Thus it happened that in Germany and France attention was directed to the bituminous shists and asphaltum to obtain an oil which might supply the place of animal oil. In the year 1820 Saussure subjected the asphaltic limestone found in Neuf-chatel to distillation, and obtained an oil from it which he describes as identical with the petroleum found in the northern part of Italy. But to Reichenbach, the proprietor of some chemical works in Moravia, most of our knowledge of the oils to be obtained from coal is due. His results were so unsatisfactory, however, considered in practical point of view, and so small an amount of oil was obtained compared with the amount of coal subjected to distillation, that the attempts of experimenters in this direction were discouraged. The extensive use which was being made of the coal for the purpose of obtaining gaseous bodies from it, served to distract the attention of inventors from the liquids it contained, and it so happened that further investigations were suspended for several years. But, in th year 1850 James Young, of Manchester, succeeded in effecting, with advantage, the distillation of coal, by subjecting it to a lower temperature than had been previously applied, and manufactured large quantities of paraffine from the coal. In 1855, paraffine works were established in Germany, at Bonn, from a tertiary or brown coal from the neighborhood, and Toplitz, in Bohemia, and since that time its manufacture has increased in a corresponding proportion to its multiplied uses. It makes a beautiful white candle; it is a ready solvent for gutter percha, india rubber and some resins, and owing to its slight affinity for other substances, it has been used as a protective covering for iron and other objects against oxidation and corrosion.

Long before, however, the manufacture of paraffine from coal had thus been profitably established, even as far back as 1842, the oils obtained from bitumens and bituminous shists, had been extensively used in Germany and France. In countries lying on the sea-coast, like Great Britain and the United States, the abundant supply of fish oils, retarded the manufacture of those to be obtained from bituminous substances; and though it had begun to be extensively developed, it has received a great check from the recent discoveries of petroleum in Pennsylvania. The latter is so much cheaper as a source of illumination, that while it is obtained with as much ease as at present, the distillation of bitumen for burning oil must be abandoned. As a source of benzole, however, and as a means of obtaining the splendid dyes now so extensively used in coloring silken and woolen goods, large quantities of coal are still consumed in England and on the Continent.—*U. S R. R. and Mining Register.*

THE FIRST PETROLEUM WELL.

THE FIRST OIL MAN STILL POOR.—It may be interesting to those of our citizens who have been so fortunate in oil speculations, to know that the first man who sunk a well lives near the spot and is still poor. Col. Drake sunk a well less than 100 feet in 1859, and was the first man to strike oil. This was on Watson's Flats, below Petersville. He reaped no advantages from his discovery, and is still living, on the creek, as poor as when he bored that well, while others have made millions by pursuing the path in which he led. It is the fate of discoverers and inventors to die poor.—*Cor. of N. Y. Times*

It is due to the truth of history to correct the above correspondent of the New York Times. The first oil well was bored by J. Cummings Cherry, now of this city, in the vicinity of what is now known as Cherry Run, Penn. It was bored in 1848, more than ten years previous to the date at which Col. Drake sunk his well. Moreover, Mr. Cherry has escaped the fate of pauperism attendant on most discovers and inventors, and is now taxed for $80,000 in Pittsburg, Penn.

ORIGIN OF THE OIL BUSINESS.

It may be interesting, at this time to give a brief notice of the origin of the oil business in this country. Mr. Cherry, the gentleman alluded to above, was engaged in 1838, by a company of adventurers to make some geological investigations after coal and iron in the vicinity of what is now known as Cherry Run, mentioned above. During these investigations his attention was first called to the existence of oil floating upon the surface of the waters of that region, and he also noticed the marked similarity between it and the oil known as petroleum, which had been brought, in small quantities, from Asia to England, and a like oil which had also been obtained, by experimental analyses, from English coals. Mr. Cherry was also personally acquainted with Mr. Young, whose experiments commenced about this time for ascertaining the nature of these oils. His attention, however, being pre-occupied, he soon dropped the subject

Subsequently, in 1848, he again returned to the same field, and for the same purpose. It was on this occasion that he bored the well alluded to above. The well was put down for scientific purposes, to examine the character of the strata, more particularly with reference to the prospects of finding coal At the depth of 200 feet the auger struck a reservoir of oil, which flowed from the well in large quantities, much to the annoyance of the landholders in the vicinity, who complained of it as a nuisance. Mr. Cherry was satisfied in his own mind, from experiments he had made, that an illuminating oil of a very superior quality could be obtained from it, and he was very urgent that the company in whose behalf he was prosecuting his investigations should take hold of the matter. They declined, believing that coal and iron were the only true sources of wealth in that direction and the project was again abandoned. Soon after Mr. Cherry came to this State to secure the means to return and carry out his ideas of producing illuminateing oil from coal and crude petroleum. Having accomplished this purpose, he returned in 1854, visited the various coal districts in the United States; went to England, had further and protracted interviews with his former friend and co-investigotor Mr. Young, who had then associated with himself Mr. Mansfield. Being satisfied of the value of their discoveries, it was agreed that if Mr. Cherry would leave the English field to Messrs. Young & Mansfield he might have that of the United States to himself. Mr. C. accordingly again crossed the Atlantic, obtained three several patents, securing to himself the benefits of his investigations, and proceeded at once to erect extensive works at Darlington, forty miles from Pittsburg, Penn. He carried on these works successfully about one year, when they were destroyed by fire. They were capable of producing about 700 gallons of refined oil per day, and cost $82,000 These were the first extensive works ever put up on the continent. After losing his works, Mr. C. devoted about two years to making further geological examinations for petroleum and coal, and then came again to this State, where he is now operating in the same line. He will soon visit the East again, to look after some infringers on his patent rights, and obtain the requisite machinery for erecting in this State, a refinery for producing kerosene from the crude petroleum, which he fully believes will soon be found here in inexhaustable quantities.—*San Francisco Mining Press.*

EARLY DESCRIPTION OF OIL SPRINGS

The following passage, copied from the Massachusetts Magazine for July, 1791, may interest those who have struck, or are expecting to strike oil:

In the northern parts of Pennsylvania there is a creek called Oil creek, which empties itself into the Alleghany river, issuing from a spring on the top of which floats an oil similar to what is called Barbadoes tar, and from which may be collected by one man several gallons in a day. The American troops, in marching that way, halted at the spring, collected the oil and bathed their joints with it. This gave them great relief, and freed them immediately from the rheumatic complaints, with which many of them were affected. The troops drank freely of the waters; they operated as a gentle purge.

There is another spring in the western parts of Virginia, as extraordinary in its kind as the one just mentioned, called the Burning Spring. It was known a long time to the hunters. They frequently encamped by it for the sake of obtaining good water. Some of them arrived late one night, and after making a fire, took a brand to light them to the spring. On their coming to it some fire dropped from the brand, and in an instant the water was in a flame and so continued, over which they could roast their meat as soon as by the greatest fire. It was left in this situation, and continued burning for three months without intermission. The fire was extinguished by excluding the air from it or smothering it. The water taken from it into a vessel will not burn. This shows that the fire is occasioned by nothing more than a vapor that ascends from the water.

There are two springs high up on the Potomac, one of which has about the same degree of heat as blood running from the veins. It is much frequented by people who have lost their health. The waters are

drank with freedom, and also serve as a hot bath, by which much good has been experienced. The other spring, issuing from the same mountain, a little farther off, is as remarkable for its coldness as the other for its heat, and differs from common springs in as many degrees.

THE DANGER OF "STRIKING OIL,"

In the oil regions, when the precious fluid is "struck," great care is necessary to prevent accidents. The gas, which is the first indication that the reservoir has been reached, rushes up with great force, and, being highly combustible, it is dangerous to have fire anywhere ear the well; even a pipe or cigar has, in some cases, c used the explosion of the gas, causing destruction of life and property. In some instances the gas has become ignited and burned for weeks, the mouth of the well being converted into a mighty gas-burner, from which a flame has risen many feet in height. Only a few days ago, a gentleman by the name of Jacob Crowe was sinking a well on George's Creek, Fayette county, Pa., and when the drill struck the oil deposit, a powerful volume of hydrogen gas ascended to the surface, filled the atmosphere, and coming in contact with a stove in a shanty some distance from the well, a terrific explosion ensued, and flames darted into the air sixty fee high! Fortunately no one was injured, and the flames were finally subdued; but the experienced borers never permit fire anywhere near the well upon which they are working.

DISTANCES FROM FRANKLIN IN THE OIL REGION TO PHILADELPHIA AND NEW YORK.

The distance from Franklin to Philadelphia is as follows:

Franklin to mouth of Kiskiminetas river	84 miles
Kiskiminetas to Blairsville Junction	33 "
Blairsville Junction, Penna. R. R. to Phil.	302 "
	419 "

The distance from Franklin to Philadelphia, via Titusville, Corry, and the Philadelphia and Erie road, is 465 miles.

The distance from Franklin to New York, via the Atlantic and Great Western and the New York and Erie Railroads, is:

Franklin to Meadville	28 miles.
Meadville to Salamanca	101 "
Salamanca to New York	414 "
Total	543 "
From Franklin to Philadelphia by Allegheny valley	419 miles.
Philadelphia to New York	90 "
Total.	509 "

The difference in favor of Allegheny Valley and Pennsylvania route to New York through Philadelphia, thirty-four miles.

The well on the Black Diamond Oil Company's property has struck the best show of oil yet on the Clarion. It occurred at 500 feet. In about an hour the sand pump brought up 13 large buckets of oil. The borers agree in setting it down as a 40 barrel well when tubed. The Deer Creek well continues to flow as usual The gas has not yet been exhausted. The well is not yet through the third sand rock, and arrangements are being made to prosecute the work until the drilling is completed. The new well on Deer creek is down about 90 feet. The engine house and derrick of the Deer creek well were carried away by the freshet.

OIL IN IOWA.—The Burlington Argus says: The Petroleum excitement in Iowa is increasing. Companies have been formed in Des Moines and other points, with capital sufficient to give the subject a fair investigation.

MINING.

COAL—ITS BEARING ON MODERN CIVILIZATION.

Of all the characteristic which have been adduced as serving to distinguish man from every other animal, none is more clearly defined and unequivocally established than the special use which human beings make of fire; and so intimately does the employment of this element appear to be interwoven with the superiority of our race, that a simple collection of the facts which first led mankind to the adoption of fuel as a source of artificial heat, would form, in effect, a key to the whole history of human progress and civilization. It may have originated in instinct, or it may have been the result of observation and reason; but from whatever it arose in the first instance, the use of fire not only established a wide distinction betwixt man and the inferior animals, but, by the relative degree of its application, constitutes no bad guide to the comparative civilization existing amongst men themselves. Thus the social position of a nation might be more correctly deduced from the extent of its application of artificial heat, than, perhaps, from any other single datum whatever. The investigation of the subject of fuel is not, therefore, wanting in importance.

When and by whom this mighty agent was rendered originally subservient to the wants of mankind, will forever remain a mystery, but from what we know of savage nations at the present day, it is almost certain that a period once prevailed in which the use of fire was unknown to humanity. The ancient mythologists tell us "it was stolen from heaven by Prometheus," which may allude to the first employment of the sun's rays through the aid of a reflector, or it may have reference to the action of lightning; but in any case, the circumstance clearly points to a traditionary epoch at which fire was unused. Remembering, however, that the employment of fuel must long have preceded every other usage of civilized life, it is easy to understand the cause of that entire silence which prevails respecting its introduction, because the practice of recording discoveries of this kind could only have ensued many ages after the use of fuel had become so common as neither to attract attention nor require comment Shut off, therefore, from every source of authentic information upon this subject, we next turn to an inquiry of the means originally used to obtain heat, and, fortunately, on this head we meet with no great difficulty. All accounts agree in declaring wood to have been the fuel of the ancients, and, in a practical sense, to have continued so up to within a comparatively recent date. True, we find the word "coal" occurring in the Scriptures, and in some old writings, but this is well known to mean "charred wood," or charcoal, and to have no reference to the mineral which now passes under that name. Admitting, therefore, the incontestible fact that, in one or other shape, wood really constituted the fuel of the ancients, let us pause for a moment to consider the effect of this peculiar circumstance, which, though seemingly of trifling import, no doubt caused the downfall of the mightiest empires of the old world. It has been said, knowledge is power, or, in other words, that the application of knowledge gives power, and, in this sense, heat is the most powerful agent which human knowledge can apply. To be useful or powerful it is, however, necessary that the source of heat should increase as the demand increases; otherwise the power must be controlled by the source, and either remain stationary or recede. With wood as a fuel, the latter conditions are inevitable, for the extension of mankind must lead to a destruction of trees in two ways—firstly, as requiring more fuel, and secondly as demanding an increased supply of vegetable food, and, consequently, a larger area of cultivated land; an enlargement of human power must therefore, in this way, diminish the source of heat, and thus these forces are brought into diametrical opposition. The carbonaceous produce of the land, if burnt in the lungs of the animal, cannot, of course, be at the same time burnt in the furnace of the steam engine; and hence an increase of the population in former times came to present the fatal anomally of a decrease in the power of production, as regards manufactured wealth. To maintain so unnatural a condition of social existence, required the exercise of means equally unnatural, and therefore that kind of wholesale plundering denominated "war" by the ancients, became an indispensable trade or business, and, as such, was carried on in succession by various nations—Assyrians, Jews, Egyptians, Greeks and Romans. By this brutal system the industrial productions of a large part of the habitable globe were periodically torn from their owners, and gathered together in some special locality already exhausted of its own resources, and here, for a time, the products of rapine served to support the contest of art with nature, and enabled the over-crowded cities of Greece or Rome, or other dominant power, to purchase at a fabulous cost those comforts and conveniences which the want of manufacturing industry denied to their inhabitants upon any other conditions. Thus a large city became in fact a kind of social "maelstrom," engulphing all, and returning only wreck, vice and crime; for how, except by injury to the best principles of human nature, can any large community exist without the regular forms of industrial production? The history of Rome, even in the most flourishing period of its existence, reads more like the records of a gang of banditti, than the proceedings of a great and honorable nation. That such a pest should have fallen at last by violence is a necessary consequence of the reaction which justice ever demands: but who can question that had Rome based her supremacy amongst men upon industrial superiority, she might yet have stood proudly at the head of human progression, and instead of miserably striving to hoodwink a jeering world by the exploded idolatry of a past age, have assisted in raising that veil which already scarcely hides the practical wonders of the coming century. But, as has been before remarked, the absence of fuel rendered any well sustained effort of the above kind impossible, and therefore the genius of the Roman people developed itself in another direction. Steam for the Romans was like aerial navigation for the English—a phantom, destitute of substance. Where was the requisite fuel to come from? And let us not forget that, without an almost endless supply of highly calorific coal, the steam engine would be quite useless even to Great Britain.—If, for argument's sake, we conceive that wood might answer the purpose, whence could the enormous quantity required be obtained?

In those situations where from necessity, wood was used formerly with Mr. Watt's engines, he was in the habit of ordering three times as much of it as of coal, to produce the same effect; and since, in stowage, wood occupies for an equal weight, double the space, we see that six times the stowage now required in steam vessels for fuel would be necessary. Had Cae ar, therefore, possessed a steamer, it would have been for him little better than a philosophical toy. It might, perhaps, have been able to carry its own machinery and fuel from the Tiber to the Thames, but for merchandise, troops, or munitions of war, there could have been no vacant space whatever; and similar difficulties would have beset the application of locomotive and even stationary engines. It is not many centuries since iron furnaces existed in most of the densely wooded parts of this island, and now where are they? The production of a few tons of iron soon laid bare many acres of forest, and the manufacturing demands of a week consumed the natural growth of a century; until ultimately, the supply of fuel being exhausted, the furnace disappeared. Where iron is still made by means of the catalan forge, it is usual to allow a consumption of seven tons of charcoal for every ton of iron produced, which is equal to the destruction of at least twenty-eight tons of timber; and since the yearly production of pig iron in Great Britain amounts to 2½ millions of tons, it would require no less than 62 millions of tons of wood to supply the annual demand of this country in respect to this single manufacture—a quantity which probably exceeds the annual growth of all Europe. It would, therefore, be quite impossible to meet the pres

ent requirements for fuel in case wood was needed to supplant coal; consequently, in contrasting our position with that of the ancients, we must not forget that even now, if limited to their circumstances in this one respect, we should not, perhaps, greatly exceed them in most others. It is the power of fuel which gives to the modern his wonderful strength, and enables him to turn the most energetic forces of nature to his use—rendering those things which were formerly impediments to human progress the means of subduing still greater difficulties. Yet this very power may be said to have offered its services to Rome, and to have been refused; for it is a curious historical fact that the kind of coal which, from its excellent quality, has given a name to all the best kinds of household coal, itself derived that name from a Roman work executed more than seventeen centuries ago. Beneath the very spot where the great wall terminated, which was built by Hadrian to repel the incursions of the Picts and Caledoniae into England, the variety of coal called Wallsend was first dug, and received its appellation from a neighboring village, which time out of mind had borne that name, and marked the termination of the wall.—How little could Hadrian or Severus, or those whom they employed, foreseen the importance of that locality from whence coals are now actually sent to light the Vatican itself! And how little did they appreciate the worth of what lay beneath their feet! The poverty of Britain was then proverbial; Caesar could find neither gold nor silver in it; and now the extraction of coal alone adds annually more than eighteen millions sterling directly to our wealth. Let us hope that the British Government at present is less blind to the real worth of our colonial possessions than were the Romans 1800 years since in regard to the universal treasures of this island.

The period at which coals were first employed as fuel seems involved in considerable obscurity, though it is probably not very remote. According to some accounts the Romans used coal during the construction of the Roman wall; but as the island of Great Britain was then almost one continuous forest, and the inhabitants far from numerous it is not likely that any deficiency of wood could ensue and give rise to the use of mineral fuel, even if we could suppose that the means of extracting and consuming it were well known. There seems, on the contrary, no reason to presume that coal found any great favor amongst the bulk of the people until the scarcity of wood rendered a change indispensable. On the sea shore and in the banks of the rivers in the North of England, the coal strata make their appearance in many places, and coal may easily be gathered by the hand; it is therefore probable that, driven by necessity, the poorest and most barbarous of the inhabitants of these districts first made trial of its calorific qualities. Beginning under such auspices, its more general introduction would be slow, and not devoid of prejudice, as appears to have been the case; whereas, had it received the sanction of Roman patronage, a very opposite effect must have followed. A manuscript yet exists, dated prior to the year 1195, in which, amongst other concessions by a feudal lord of that day to several of his vassals in the neighborhood of Bishopwearmouth, there is a grant of twelve acres of land to a blacksmith or armorer, with the privilege of extracting coal for the use of his forge. But the first evidence of this description, which is of an incontestible nature, as establishing the value of such a concession, is a charter by Henry III, granted to the inhabitants of Newcastle, and bearing date December 1st, 1239; this charter, in reply to the demand of the burgesses of that town, granted them the power, or royalty of extracting coal and stone in their neighborhood.

The name given to coal at this period seems, however, to show that it was even then an article of transport by sea, for it is ever ready, and compelled, by what seems to be an inexorable law, to destroy this simplicity, and incessantly show their power in effecting the purpose. All he wished was to keep this incessant change and tendency to simplification in view, in order to make an effort to arrive at something like a rational solution of the causes which have been, and may be, at work in the formation and obliteration of coal.

Assuming that these premises are correct, that incessant change is the law of Nature, and that this change tends in one way to simplification, and in another to the contrary, it would not require a great stretch of the imagination to suppose that coal was formed by some such simplifying process, and obliterated from the same cause. We will, however, at present deal only with the formation of coal. With regard to this we could easily conceive that there was a time when a particular portion of undeveloped strata, which had been carried into some estuary, or submerged by some depression, and afterwards covered over, was more carbonaceous in its nature and composition than the surrounding mass and that this portion of strata, highly charged with carbonaceous matter (it might be from a submerged peat moss, or a great accumulation of vegetable matter, such as driftwood, etc.,) would become the matrix of a bed of coal, and thus by extracting carbonaceous matter from the surrounding mass, and expelling or being robbed of foreign matter which it contained by the law of chemical affinity, or some other law with which he was equally unacquainted, would assume the appearance and have the qualities of what we call coal. Such, with all deference, he considers a plausible theory of the formation of coal. The same process would apply to the formation of beds or seams of ironstone, whether carbonaceous or argillaceous. In fact, it would apply to all the other metals as well, whether found stratified, in nodules, veins, or other shape.—*Newton's London Journal of Art.*

RICHNESS OF ORES—NEVADA & COLORADO.

We find in our exchanges extended annual reports of the Gould & Curry and the Ophir mines of Nevada.—They are renowned over the world for their richness. To know, therefore, exactly how rich they are, and to be able to compare their yield with that of our own Territory, may be a matter of some interest to our people.

According to the report of the Gould & Curry Company, the average yield of 66,559½ tons of ore was $73 48 per ton; while the yield from the Ophir mines, as near as we are able to estimate it from the data given, was considerably less.

The first class ore was all shipped to England for treatment; the second class was treated in the mills of the Territory, and yielded an average of $172 14 per ton; and the third class yielded $58 38 per ton. It is estimated by the directors of the company, that the company will be able to declare a dividend of from $50 to $75 per foot per month to the shareholders, with a prospect of even more. It should be remembered that this is the richest mine of the State, and that a host of others are paying very large dividends. Another feature to be remarked is, that the ores of both these companies are worked in such a manner that only about four per cent. of the silver and gold contained in them is lost.

To compare Colorado, then, with Nevada. Since we have taken the richest mine there, we should take the richest here. Counting ten tons to the cord, the average yield per cord would be $734 80; but really this average is about one-fifth too large—the true average being $587 84 per cord. We have dozens of lodes the ores of which will yield more than this, provided we can save within ten per cent. of the amount contained in them. The average assays of our ores certainly warrant us in saying as much. This is so well settled in the mind of every Coloradan, that it needs no facts or arguments. With us the only question is, can we save the gold and silver, and how? This double question appears likely to be solved to our satisfaction. We certainly believe it will be within a few months, and we are therefore perfectly satisfied that Colorado is far ahead of any other American Mining country; and we also believe that we may safely take courage and expect the good time coming, as one of the things foreordained from all eternity.—*Colorado Mining Register.*

THE COAL AND LIGNITE PRODUCTION OF AUSTRIA.

Although we have good reason to believe that, with the exception of Spain and England perhaps, where mining operations were carried on by the Phoenicians, Austria is the first country in Europe where mines were worked, and the manufacture of iron was known, still it is only very recently that the coal and iron industry has begun to occupy a position more in accordance with that of the other German States. The Morcian steel was already celebrated in ancient times, but Austria has likewise extensive coal beds in all the crown lands, and amongst them Bohemia in this respect undoubtedy occupies the first place. The most important basin is situated on her Western frontier, not far from the spot where the Moldan flows into the river Elbe, which till now, however, has been opened in the upper levels only. The following numbers will prove better than anything how considerable the increase of the coal and lignite production has been during the last few years: In 1855 it was only 2,101,045 tons; while in 1862, 4,552,485 tons of coal and lignite were raised (in Prussia 16,895,000 tons). In 1863 the quantity had considerably increased, and it is a strange circumstance that at the same time, while Westphalian coals have been imported in large quantities, and even forwarded beyond the Elbe districts, the consumption of English and Bohemian coals in Austria has considerably decreased. The coal prices, on account of the high rate of carriage exacted by the railway companies, are still very high in Austria, and the importation of cheaper foreign coal, therefore, leaves no margin for profit.—*London Colliery Guardian.*

MINING IN OREGON.

From every mining camp in Southern Oregon, says the Jacksonville Sentinel, comes cheering, golden news. Water is abundant, and all hands are at work. Take the mines in the aggregate, and they will yield, this Winter, at least five dollars per day to the man There are at the present time, exclusive of Chinamen and Kanakas, from five to eight hundred men employed in the mines of this county. There are probably a thousand Chinamen. The flood did the miners much injury in carrying away flumes and reservoirs, but there was a compensation attending that injury. Accumulated deposits of tailings were swept away, and old channels cleaned out to the bed of rock.

DETECTION OF BURGLARS.

We take the following from the London Builder:

Allow me to suggest a contrivance for the better security of property, and by which a burglar might be detected at his work. A common gas lamp, provided with a red shade, similar to those used on the railways, should be suspended in the street in front of the bank or shop, where valuable articles are kept; the red shade should be held up above the lamp by a magnet, worked by a small battery, situate at any convenient place on the premises; the wire from the battery to the magnet should pass through the safe, doors, and drawers containing valuable articles; and as long as the connexion is complete between the battery and the magnet, the red shade would be held up in its place above the lamp, showing a white light; but as soon as the connexion was broken by opening any of the doors or cases, the magnet would immediately lose its power, and allow the shade to fall in front of the lamp, thus showing a red light, and giving notice to any one in the street that something was wrong inside; and when once the shade had fallen, it could not be replaced by the burglar. These magnets are very simple, being made of a piece of soft iron, bent in the form of a horse-shoe, with a coil of copper wire round the ends; and the cost of working the battery would be a trifle. GEO. E. ELLIOTT.

Time is the bell ringer of the universe. He strikes the hours even now, presently he will peal the chimes.

We take the following Report from statement made to the stockholders of the Morris Canal and Banking Company, for April, '65'

ANTHRACITE COAL TRADE OF THE UNITED STATES.

The following Table exhibits the quantity of Anthracite Coal sent to market from the different regions in Pennsylvania from the commencement of the Trade, in 1820, *to* 1864, *inclusive; to which is appended the Semi-Anthracite Trade, the Cumberland Bituminous Trade, the Importations of Foreign Coal, and the Exportation of Domestic Coal:*

YEARS.	HARD ANTHRACITES.																	
	SCHUYLKILL.					Sold on line of Schuyl-kill.	LEHIGH.			WYOMING REGION.						Shamo-kin.	Aggre-gate.	Annual Increase.
	Canal.	Railroad.	Total.	Pine Grove.	Little Schuyl-kill.		Canal.	R'Road.	Total.	By L'high R. R.	Del. and Hudson Coal Co	Penn. Coal Co.	By Canals	Great Western R. R.	L. & B. Railroad	Total.		
1820							365		365								365	
1821							1,073		1,073								1,073	708
1822	1,480		1,480				2,240		2,240								3,720	2,647
1823	1,128		1,128				5,823		5,823								6,951	3,231
1824	1,567		1,567				9,541		9,541								11,108	4,157
1825	6,500		6,500				28,393		28,393								34,893	23,785
1826	16,767		16,767				31,280		31,280								48,047	13,154
1827	31,360		31,360				32,074		32,074								63,434	15,387
1828	47,284		47,284			3,154	30,232		30,232								77,516	14,082
1829	79,978		79,978			8,332	25,110		25,110		7,000					7,000	112,083	34,567
1830	89,984		89,984			5,321	41,750		41,750		48,000					48,000	174,784	62,651
1831	81,854		81,854			6,150	40,966		40,966		54,000					54,000	176,820	2,036
1832	209,271		209,271		14,000	10,048	70,000		70,000		84,600					84,600	363,871	187,051
1833	252,971		252,971		40,000	13,429	123,000		123,000		111,777					111,777	487,748	123,877
1834	226,692		226,692		34,000	19,429	106,244		106,244		48,700					48,700	376,636	d111,112
1835	339,508		339,508		41,000	18,571	131,250		131,250		90,000					90,000	560,758	184,122
1836	432,045		432,045		35,000	17,863	148,211		148,211		103,861					103,861	684,117	123,359
1837	523,152		523,152	17,000	31,000	21,749	223,902		223,902		115,387					115,387	879,444	195,327
1838	433,875		433,875	13,000	13,000	28,775	218,615		218,615		78,207					78,207	738,697	140,747
1839	442,608		442,608	20,539	9,000	30,330	221,025		221,025		122,300					122,300	11,930	818,402	79,805
1840	452,291		425,291	23,860	20,000	28,924	225,318		225,318		148,470					148,470	15,705	864,384	45,982
1841	584,692	850	585,542	17,653	40,000	41,223	143,037		143,037		19,270					192,270	21,463	959,978	95,589
1842	491,602	49,902	541,504	32,381	37,000	40,584	272,546		272,546		205,253		47,346			252,599	10,000	1,108,418	148,445
1843	447,058	230,254	677,312	22,905	31,000	34,619	267,798		267,798		227,605		58,000			285,605	10,000	1,263,598	155,180
1844	398,887	441,491	840,378	34,916	57,000	60,000	377,092		377,092		251,005		114,906			365,911	18,087	1,630,850	367,252
1845	263,557	820,237	1,083,796	47,928	74,000	90,000	429,458		429,458		278,435		178,401			451,836	10,000	2,013,018	382,168
1846	3,440	1,233,142	1,236,582	58,926	91,000	155,460	517,116		517,116	5,886	320,000		192,508			518,389	12,572	2,344,005	330,992
1847	222,693	1,360,681	1,583,374	67,457	106,401	226,610	633,507		633,507	10,466	388,203		284,398			683,067	14,904	2,882,309	538,304
1848	436,602	1,216,233	1,652,835	61,530	162,626	252,857	670,321		670,321	10,425	437,500		237,271			685,196	19,356	3,089,238	206,929
1849	459,208	1,115,918	1,605,126	78,299	174,758	239,290	781,656		781,656	19,590	454 240		259,080			732,910	19,656	3,217,641	128,403
1850	288,030	1,423,977	1,712,007	70,919	211,960	207,863	690,456		690,456	32,156	441,403	111,014	243,250			827,823	19,921	3,321,186	103,495
1851	579,156	1,650,270	2,229,426	*none.*	810,307	812,367	964,224		964,224	25,072	479,078	816,017	836,000			1,156,167	24,899	4,329,580	1,008,394
1852	800,038	1,650,912	2,450,950	66,543	325,099	322,211	1,072,136		1,072,136	41,890	497,103	426,164	319,841			1,284,500	25,846	4,899,975	570,445
1853	888,695	1,582,248	2,470,943	80,660	389,295	394,078	1,054,309		1,054,309	26,235	494 327	512,639	442.51			1,475,732	15,500	5,097,144	197,169
1854	907,354	1,987,854	2,895,208	91,462	441,184	444,160	1,207,186		1,207,186	30,282	440.944	496,648	492,689	132,965		1,603,478	63,500	5,831,834	734,690
1855	1,105,268	2,213,292	3,318,555	112,213	426,208	471,861	1,275,050	9,068	1,284,113	50,209	565,460	504,806	404,039	187,080		1,711,511	116,117	6,486,097	654,263
1856	1,169,453	2,088,903	3,258,356	157,152	454,515	520,499	1,186,230	165,740	1,351,970	44,270	499,650	612,500	510,631	305,530		1,972,581	137,406	6,751,542	256,445
1857	1,275,989	1,709,552	2,985,541	145,012	346,877	511,977	909,814	418,235	1,318,541	37,959	480,699	586,008	407,914	490,023		1,952,603	155,806	6,431,378	d320,164
1858	1,323,804	1,542,645	2,866,449	187,376	383,931	441,166	909,000	471,030	1,380,030	69,644	348,789	630,056	346,420	683,411	210,042	2,186,094	135,893	6,524,898	93,460
1859	1,372,021	1,632,932	3,004,953	125,262	366,348	554,774	1,050,659	577,652	1,628,311	71,399	591.000	688,854	453,548	829,435	223,806	2,781,236	180,738	7,517,516	1,092,678
1860	1,356,688	1,878,156	3,270,516	152,957	323,136	608,877	1,791,032	730,642	1,521,674	100,277	499 568	701,523	435,306	1,080,227		2.856,896	210,108	8,059,017	511,501
1861	1,188,570	1,460,832	2,597,489	167,357	171,432	435,320	994,705	743,672	1,738,377	111,073	726.644	629,657	316,765	1,104,319		2,918,458	241.451	7,487,672	d574,345
1862	981,729	2,305,606	2,890,598	183,985	249,451	545,916	896,227	882,578	1,351,054	26,728	637,066	601,091	559,246	1,094,315		3,180,887	241,642	7,640,905	188,233
1863	835,842	3,065,261	3,433,265	212,794	385,788	671,589	699,558	1,195,155	1,894,718		828,150	662,904	602,721	1,223,165		3,766,374	274,986	9,420,185	1,779,290
1864	1,000,500	3,065,579	3,642,218	211,216	567,498	748,448	758,087	1,295,419	1,928,706	9,314	852,189	759,544	630,142	1,302 457	928,701	3,961,342	333,478	9,992,007	557,624
	22,120.411	35,676,725	56,673,207	2,411,302	6,336,572	8,580,064	20,054,015	6,489,181	26,489,758	731,820	12,133,822	8,189,441	7,992,438	5,433,847	1,362.449	38,565,767	2,335,728	124,781,542	

COAL TRADE OF THE UNITED STATES.—(*Continued.*)

YEARS.	SEMI-ANTHRACITE AND BITUMINOUS.									Aggregate of all kinds.	Total Increase and Decrease.	Exportation of Domestic Coal.
	Lykens Valley.	Short Mountain.	Dauphin County.	Treverton.	Broadtop.	Cumberland.	Import of Foreign Coal.	Aggregate.	Increase and Decrease.			
1820										365	22,530	
1821							22,122	22,122	22,122	23,195	15 052	
1822							34,523	34,523	12.420	38,245	d869	
1823							30,433	30,433	d4,090	37,384	d25,999	
1824							7,228	7,228	d30,156	18,386	42,205	
1825							25,645	25,645	18,417	60,588	23,174	
1826							35,665	35,665	10.020	83,712	19,979	
1827							40,257	40,257	4,592	103,691	6,127	
1828							32,302	32,302	d7.955	109,818	47,658	
1829							45,393	45,393	13,091	157,476	75,394	
1830							58,136	58,136	12,743	232,870	d19,541	
1831							26,509	26,509	d21,627	213,329	228,520	
1832							72,978	72,978	36,496	436,849	143,331	
1833							92,432	92,432	19,454	580,180	d131,918	
1834							71 626	71,626	d20,806	448,262	162,465	
1835							49 969	49,969	d21,657	610,727	181,822	
1836							108,482	108,482	58,463	792,549	240,345	
1837							153,450	153,450	45,024	1,032 894	d165,114	
1838							129,083	129,083	d24,367	867,780	132,178	
1839							181,551	181,551	52,468	999,953	27,298	
1840							162,867	162,867	d18,648	1,027,251	88,116	
1841							155,394	155,394	d7.473	1,115,367	136,278	
1842						1,708	141,521	143,227	d12,167	1,251,645	63,198	
1843						10,082	41,163	51,245	d91,982	1,314,843	417,970	
1844						14,890	87,078	101,963	50,718	1,732,813	390,630	
1845						24,653	85,776	110,429	8,466	2,128,443	397,210	
1846						29,795	156,853	176,648	66,219	2,520,658	567,517	
1847						52,940	148,021	200,961	24,313	4,088,170	276 807	9,309
1848						79,571	196.168	275,739	74,788	2,364,977	218,615	9,661
1849	25,325					142,449	198,218	865,987	90,248	3,583,628	152,558	88,741
1850	37,763					196,848	180,489	415,050	50,063	3,736,186	1,139,997	87,727
1851	54,200		20,000			257,679	214,774	546,653	131,603	4,876,183	644,481	45,386
1852	59,857		33,689			334,178	183,015	610,689	64,036	5,510,664	448,975	79,510
1853	69,007		29,000			533,980	231,508	862,495	251,806	5,959,639	948,859	93,848
1854	57,500	50,000	63,000			659,651	252,865	1,071,664	209,169	6,903,498	652,582	110,586
1855	66,721	50,500	1,000			662,272	287,408	1,069,933	d1,731	7,556,030	802,929	136,594
1856	61,187	41,739		78,112	42,000	706,450	173,085	1,107,417	37,484	7,858,959	130,355	d265,842
1857	65,201	56,538		110,711	78,818	582,486	238,192	1,161,746	54,328	7,599,118	181,270	118,304
1858	72,898	55,447		106,686	105,478	649,656	259,885	1,249,550	87,804	7,774,388	1,115,399	151,492
1859	67,564	71,148		124,290	130,595	726,354	281,208	1,372,271	122,721	8,889,787	654,747	187,069
1860	78,208	100,652		90,148	186,908	788,909	240,697	1,485,517	113,246	9,544,584	d700,570	158,171
1861	81,000	91,380		49,477	272,625	836,980	583,115	1,359,292	126,225	8,843,964	158,657	216,458
1862	82,092	95,119		63,223	333,606	239,804	545,433	1,359,158	424	9,000,621	2,586,499	173,021
1863	77,608	63,674		62,200	305,678	657,050	1,000,775	2,166,985	807,269	11,287,120	454,019	175,039
1864	68,021	61,952		56,301	386,645	665,605	510,608	1,749,132	d417,853	11,741,139		
	1,023,562	788,149	146,639	786,148	1,862,343	8,588,890	7,723,760	20,560,304		144,338,700		

GAS.

NEW GAS GENERATOR.

Several apparatus have been from time to time contrived for the purpose of producing an inflammable gas by the admixture of common air with the vapour of hydrocarbon essences or oils; but a considerable amount of mechanical agency had to be resorted to in order to effect this admixture, until M. Mille's gas generator came into the field. This apparatus consists of several flat dish-like cylinders, placed one over the other, and held together by any convenient supports or framework. The upper cylinder is furnished with an open tube, fitted to its upper surface at one end, to admit the air to the liquid contained in the cylinders, and an exit pipe at the opposite end of the same surface conducts the air, when it has passed over the surface of the liquid in this cylinder, into the second receptacle immediately below it, where it passes over a second surface of evaporating fluid, and is thence conducted in like manner to the third cylinder, whence it flows to the burner by means of an ordinary gas-pipe. This admixture of common air and vapour being heavier than atmospheric air, descends by its own weight to the burner, in the same way as the oil in old-fashioned lamps; consequently, all that is necessary to ensure a current of air inwards at the top of the apparatus, and a continuous flow of gas from the bottom cylinder, is to have the machine placed at a higher level than that of the burners it is intended to feed, and the more elevated this is the greater the downward pressure of the gas, and the more powerful the flame. Experiments made on a large scale in the workshops of M. Camille de Lavenant, 24, Rue de Chastillon, proved that a height of about 6 metres (19·7 feet) will suffice to enable the gas, spontaneously generated by the passage of air, though circulating through a tube with only a slight inclination, several times bent horizontally and vertically, to attain considerable distances, and supply the burners on all sides of a vast *atelier*, with gas equal in brillancy to the best street gas, though the latter is supplied at a much higher pressure, the burners used being the same as those for ordinary coal gas, giving a clear flame, without smoke or any deposit of carbon, and without fouling or otherwise injuring the metal or India-rubber conduits, leading the gas through its self-acting circuit. These gas generators can be constructed of any size, the most convenient being from 9 inches to 3 feet diameter, according to the extent of the required illumination. The size for two or three lights, burning 5 cubic feet per hour each, is an apparatus with three cylinders, 9 in. diameter and 1 in. high. The depth of the layer of liquid in each cylinder should not exceed ¼ inch. In general, whatever be the size of the generator, every kilogramme of liquid evaporated produces two cubic metres of inflammable gas; therefore, as a kilogramme is about 35 avoirdupois ounces, and a cubic metre is about 35 cubic English feet, an avoirdupois ounce of essence will make 2 cubic feet of gas. For this size of apparatus, holding 18 ozs. of liquid in each cylinder, or 54 ozs. in all, we have, then, 108 cubic feet of gas formed before the cylinder would be empty, and require the addition of more spirit. This would supply three lights, burning 5 cubic feet each per hour, for seven hours. For supplying large establishments, or several at once, Mille's gas apparatus of requisite calibre can be placed in the upper story of a house, and the gas be laid on as for ordinary coal gas, with this exception that, as the pressure is exerted by the weight of a column of gas, the tubes for it should be slightly of larger diameter than those for coal gas; one or two gauze wire diaphragms should also be inserted in the tubes just before the burners, to prevent the possibility of the flame spreading to the conduits. The spirits or essences used should not be of higher specific gravity than 650, and should be as pure as hydrocarburet as possible; such as the light essences of petroleum, formed by the distillation of the raw oils, and of which it is absolutely necessary to deprive these, in order that they may be burned without danger in lamps with wicks. These essences contain no fatty acids, and are not used for any purpose in commerce, but as a substitute—and an inferior one too—for spirits of turpentine used in house painting, &c., so that to convert them into gas is the best use they can be put to. When the burners of Mille's gas generator are closed as in the daytime, and the apparatus full, even of spirit, no additional vapour is produced by the essences, beyond that which is already in the tubes, and with which the air therein is saturated. Thus, the gas remains stagnant in the tubes always ready to be lighted, and never by any possibility escaping about the premises, except through damage done to the apparatus. A homestead cheerfully and safely illuminated with gas has hitherto been a luxury only attained by the more comfortable classes, but here we have a spontaneously-produced supply of gas, furnished by an apparatus which is unattended with expense and encumbrance of gas meters on mains, can never wear out, and is within the reach of most humble cottager.

THE GAS WORKS OF LONDON.

By Zerah Colburn, C.E., M. Inst. C.E., &c. London: Spon, Bucklersbury

A very interesting and useful little volume, founded upon a series of articles which appeared some two years since in the Engineer, by Mr. Zerah Colburn, has just been issued under this title, the object of the book being not to lay claim to a position as an exhaustive treatise upon the manufacture of gas, but to give some special and exact information not embodied in any other volume. Mr. Colburn observes that within the last ten years the details of gas-making in London have been greatly changed, clay-retorts have become universal, and so, in London at least, has become the substitution of oxide of iron for lime as a purifier. So too the residual products, and their conversion into marketable goods, have become the salvation of many a gas company at one time well nigh bankruptcy. Such being Mr. Colburn's explanation of the character of the treatise, it may fairly be said that the contents more than fulfil the expectations that will be entertained of it, the book being one from which very much can be learned, and which may induce improvements in other branches of industry.

The metropolis, we are told, is supplied by 13 companies, who carbonise between them 850,000 tons of coal annually, and produce about 8000,000,000 feet of gas, of which one-eighth is loss by leakage from the mains, &c., and the remainder sold for about 1,400,000*l*. Other estimates give 1,000,000 tons as the amount of coal carbonized yearly, the sale of gas and residual products amounting to 2,000,000*l*., equal to 14s. 6d. for every man, woman, and child in the metropolis. Mr. Colburn next gives a list of the several gas companies, the first of which was the "Chartered," originally incorporated as "The Gas Light and Coke Company," which commenced business in 1812; and then remarks that illuminating gas is produced by the decomposition of organic substances, of which coal is among the cheapest and most convenient; he observes, however, that some interest has been aroused by the gas-producing properties of peat, the results thus far being encouraging, and it may be that peat gas will by-and-by come into extensive use.

The general process of gas making having been described, Mr. Colburn points out the several variations in detail observed at the works of the different companies. The most minute particulars are given upon each point, so that every facility is afforded for testing the accuracy of the author's calculations and estimates with reference to the cost and profit of gas-making. He finds that in 1861 the capital in shares and loans employed by the 13 companies was 5 602,900*l*., of which the share capital receiving dividend was 4,455,-581*l*. The whole cost of coal was 728,551*l*., and of manufacture and management 573,003*l*., making 1,301,-554*l*. The gas rental was on the other hand, 1,411,-788*l*. and the sale of re-sidual products increased this by 341,071*l*., making 1,752,849*l*. Deducting interest and all charges, the profit amounted, however, to 416,-697*l*. The cost of coal being 728,651*l*., and the prices paid by each company being tolerably well known, it may be estimated that 882,780 tons of coal were carbonised, and if the average quantity of gas made per ton of coal be taken as 9200 cubic feet, we have 8,121,-484 thousand cubic feet as the total production. If, however, the average price of gas sold was 4s. 6d., it will be seen that the rental covers the sale of but about 6,275,000 thousand feet. A large quantity of gas, generally estimated at not far from one sixth of the whole production, is lost by leakage; but it is possible that even this estimate is below the truth. Taking the gas actually paid for at 4s. 6d. per thousand, its cost is 2s. 4d. for coal and 1s. 10d. for manufacture and management, making 4s. 2d. in all; but of this rather more than 1s. 1d. is returned in residual products. Thus, the nett cost may be taken at 3s. 1d. Then, for every ton of coal carbonised yearly in the gas works of London, about 6*l*. 10d. of xed capital is invested, and at the now usual rate of 10 per cent. dividend, there is thus a charge of 13s. per ton of coal as profits. This estimate of capital includes that borrowed, however, but taking this as bearing interest at 5 per cent., the charge for interest and profit is still 11s. 6d. per ton of coal carbonised, or 1s. 7¼d. per thousand feet of gas for which payment is actually received. The price of coals, Mr. Colburn concludes, can hardly be expected to diminish, and, therefore, after all the agitation created by a certain class, the only hope of cheaper gas lies in one or all of three contingencies. First, in diminished leakage; second, in making a greater profit upon the residual products; and third, in a diminished profit upon the capital employed. It is quite possible that all the ordinary gas burnt in the metropolis may yet be sold at 4s., but any diminution must be the result of time. Taken as a whole, Mr. Colburn's little book will, doutless, receive extensive patronage, and it certainly cannot be read through without proving profitable to the reader.—*English Paper.*

THE MAGNESIUM LIGHT.

This powerful light has just received a new application in connection with the laryngoscope, a small apparatus consisting of two mirrors by means of which the lower parts of the larynx may be conveniently brought to view. M. Maisonneuve, being desirous of showing his students the manner of using this apparatus, requested Dr. Fournie, the inventor of the improvement we are about to describe, to attend a late clinical lecture of his. Dr. Fournie did so, bringing a patient with him who was suffering from a polypus situated deep in the throat. This tumor, of the size of a filbert, not only impeded the free articulation of sound, but might in the end, by its growth, have rendered respiration impossible, and consequently caused death by suffocation. In order to render this pathological phenomenon visible to the students and physicians who crowded the lecture room, M. Fournie made use of the magnesium light, which, owing to its dearness (a shilling per minute), is as yet not generally known. By means of M. Mathieu-Plessy's lamp, specially constructed for the magnesium light, strong luminous rays were projected on the mirror placed at the furthest end of the fauces, and thence reflected into the larynx and the trachaea. These parts being thus powerfully illuminated, were visibly depicted on the mirror, but the image was necessarily small, the mirror not being more than two centimetres square. But on a bi-convex lens being placed before the patient's mouth, the image became so enlarged that every one could distinguish it from a distance of a few metres. These two applications of important scientific discoveries and contrivances combined are highly interesting; in the first place, by the aid of the magnesium light, the exact site of the slightest sore in upper respiratory organs may be discovered by physicians; and in the second place, the same may be rendered visible to a numerous audience.—*Galignani.*

It is more from carelessness about the truth, than from intentional lying, that there is so much falsehood in the world.—Dr. Johnson.

WATER.

FIFTH ANNUAL REPORT OF THE NASSAU WATER DEPARTMENT, OF BROOKLYN, N. Y.

BROOKLYN, January 1st, 1865.

To the Hon. the Common Council:

Gentlemen—Pursuant to the requirements of the Act entitled "An act to provide for the supply of the city of Brooklyn with Water," passed April 16th, 1859, the Board of Water Commissioners would respectfully report:

That the total receipts of the Department, from January 1st, 1864, to date, have been as follows:

Regular Water Rates,	$286,438 50
Extra,	99.361 04
Water Permits (less paid tappers,)	616 54
Amount paid City Treasurer,	$386,416 08

Being an increase of revenue over that of the year 1863, of $23,666 28. There is yet remaining unpaid water rates, up to the present date, the sum of $249,279 85, of which the sum of $175,339 44 is subject to a default of one per cent. per month until paid.

The works are all in good order, and no accident has occurred during the year to interfere with a full supply of water for all purposes, we are somewhat disappointed in the amount of our receipts for 1864, which are only $23,666 28 over those of 1863, while the receipts of 1863 were $59,453 87 over those of 1862.—One cause for this difference is in the fact, that there were two miles less water pipes laid in 1864 than were laid in 1863. Again, the arrearage account has increased over that of 1863, $29,119 90; the cause of this may be from the fact that less property changed hands in 1864 than in 1863, but we feel confident that the time is not far distant when the water revenue will be equal to the interest on the water loan, and current expenses of running the engines and keeping the works in thorough repair. At present our expenses are very much increased from the extravagant prices of all materials and labor, the increased cost of coal alone being about $18,000 over that of 1863, and other materials in the same proportion.

We would here state that we have at Ridgewood engine house two of the largest pumping engines in the world (so far as we know,) which require the most vigilant care and attention. The fact is that all of our extensive works are of such a nature as to require vigilant and constant care to keep them in proper repair, extending, as they do, about twenty two miles from the City Hall.

Cost, per million gallons, for pumping during the last three years, has been as follows:

	1862.	1863.	1864.
Labor, coal, &c.	$12 22	$13 50	$16 89
Interest	9 04	7 23	5 90
	$21 26	$20 73	$22 79

The whole cost of the water, as delivered in the city the past year, including expense of pumping, as given above, and all other expenses, has been 14 65-100 cents per 1000 gallons.

DAILY SUPPLY OF WATER.

The daily supply of water has averaged:

For the year	1864	8,285,000 gallons.
do.	1863	6,778,800 do.
do.	1862	5,249,200 do.
do.	1861	4,244,900 do.
do.	1860	3,439,300 do.

The increased supply required the past year has been a little over 22 per cent. over that of the year 1863. The increase each year, for the whole period given above, has been so nearly 25 per cent. that we cannot be far wrong in assuming it will equal that amount for the next two or three years, or until the whole city becomes entirely supplied with water.

Assuming the increase for the next two years to average 25 per cent., the supply required for 1865 will be 10,400,000 gallons, and for 1866, 13,000,000 gallons.

MAINS AND DISTRIBUTION PIPES.

The number of miles of cast iron pipes laid the past year was six and one eighth making the total number of miles of main and distribution pipes now laid in the city, one hundred and seventy-one and three fourths.

METERS.

There are at this time two hundred and eighty-six meters in operation.

One hundred and ninety-four of	⅝ inch.
Seventy four	1 inch.
Nine	2 inch.
Seven	3 inch.
One	4 inch.
One	6 inch.

Forty of which were set the past year. From past experience we are satisfied that the supply of water by meter is the only true and equitable way, so that all who use the water may pay for what they use and no more. We have meters at present on nearly every manufacturing establishment and other places where large quantities of water are used, and shall continue to apply them as circumstances may require, but at the present time the high price of meters will not warrant a general use thereof, as it would be a loss instead of a gain to the water revenue.

HOW RAIN IS PRODUCED.

An elevation of temperature is followed by an evaporation of water into the air, but the process is comparatively slow, and it is a long time before the air is fully saturated. So, also, when the air is saturated, a depression of temperature is followed by the condensation of a portion of the vapor into rain, but the mass of the atmosphere tempers the abruptness of the transition. The vapor condenses first into vesicles, or minute hollow bubbles of water, so light that they float in the atmosphere; and when these bubbles break and the drops of rain fall, they are wafted down so slowly through the resisting medium that the "soft falling snow and the diffusive rain" have become fit emblems of the beneficence of God, as they give the strongest evidence of his wisdow and skill. Moreover, the glorious clouds which add so much beauty to the landscape, and typify, in their virgin whiteness, the Purity of heaven, are only collections of these vesicles of water floating in the upper atmosphere, and mark the stage of transition between vapor and rain. From the whole surface of the globe, water is constantly evaporating into the aqueous atmosphere which surrounds it. The heated air from the tropics, heavily charged with moisture, is continuelly moving toward the colder regions, both of the north and of the south; and as the aerial current thus becomes chilled, the vapor is slowly condensed, and the water showered down in fertilizing rains on the land. Thus it is that those beautiful provisions which we see in the rain all depend on the presence of the air, and result from a careful adjustment of the properties of aqueous vapor to the exact density of our atmosphere.—*From "Cassell's Illustrated Family Paper.*

Recently some persons engaged in making turpentine in Plumas County, California, tapped some pine trees of a species new to them. The fluid flowed abundantly, but it had a peculia odor, and when taken to the turpentine stills in the neighborhood, nothing could be done with it. At last it fell into the hands of a man who managed to distil a liquid, which proved to be a new discovery Instead of the disagreeable odor of turpentine it has a fragrance like citron, and is free from all resinous matter. Ten gallons of it weighs as much as six and three-quarter gallons of pure water. It dissolves all the animal and vegetable oils, and leaves no stain of its own, nor does it affect any of the colors used in dyeing, and thus it is an excellent substitute for benzine, without the odor which makes the latter substance so offensive. It is also much cheaper than benzine. The new liquid is called "erasine," because of its value for cleansing. It evaporotes rapidly and burns well, but it is more expensive than coal oil. This novel product of California is now in market.

NEW FUEL.

A newspaper of Tepic, Mexico, speaks in high terms of a late discovery that has been made to apply to purposes of fuel the stone of the guacoyol, the fruit of a species of palm that grows on the Pacific side of Mexico. From experiments made on board of English war-steamers, it has been discovered that, used as fuel, the stone of the guacoyol is equal to the best coal, both for length of time it burns and the intensity of heat produced. It has likewise the advantage over coal, that there is no disagreeable smell from the exhalation of gas, nor does it dirty the holds, nor the persons who have to take it out; its shape is also in its favor for employing directly, and it is not subject to spontaneous combustion or damage by leakage of the ship.

The guacoyol, as already stated, is the fruit of the palm with which nature has covered the Mexican coast of San Blas and the valley of Banderas. The quantity of this fruit which can be collected annually is incalculable. Thousands of tons, says the Tepic newspaper (*El Orden*) can be gathered at a very slight expense, and easily supply all the steamers of the Pacific coast—the difference of price between it and coal at San Francisco being about one-half. The objection is, that the supply can only be temporary, as the daily consumption of one vessel would take the produce of thousands of trees to supply it.

A LONG STRETCH.

The new Atlantic cable which is now in process of manufacture in England, to be laid next summer, is to be 2,300 miles long, allowing four or five hundred miles for all contingencies; and its core, through which the electricity passes, is to be composed of seven strands of the best copper wire, making together over 16,000 miles of copper wire: this is to be inclosed in eight coats of insulating material, amounting to 18,406 miles: then follow ten coatings of jute, making 23,000 miles; and ten iron wires, making 23,000 more; and as each wire is covered separately with five twists or strands of yarn, there will be worked into the cable 135,000 miles of yarn—making altogether a length of material which amounts to 213,500 miles; or sufficient, if placed end, to go round the earth nearly nine times, and lacking only 21,500 miles of being enough to reach from the earth to the moon—the latter distance being, as measured by astronomers, 237.000.—ARTISAN.

TESTIMONIAL TO THE COMMISSIONER OF PATENTS.

The clerks and employees in the Bureau of the Commissioner of Patents (Hon. D. P. Holloway) recently presented that gentleman with a handsome album containing their photographs—about one hundred in number. The occasion was the fourth anniversary of the day on which Mr. Holloway commenced the supervision of the Patent Department; and his associates took that method of expressing their appreciation of the uniform kindness they had received at his hands, and their respect for him as an officer and a gentleman.

IMPROVEMENTS IN PHOTOGRAPHY.—Among the recent improvements in the art of Photography is that of Photographing on porcelain. The effect is quite pleasing, the picture being clear and distinct like fine line engraving, and especially beautiful when suspended where the light can pass through the porcelain, which renders the shading soft and delicate, and brings out many effects which cannot be produced in any ordinary picture.

There is this difference between happiness and wisdom: he that thinks himself the happiest man, really is so; but he who thinks himself the wisest man, is generally the greatest fool.

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PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.

W. S. SHERMAN, PUBLISHER.

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The Mining and Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, ... EDITOR.

TUESDAY, MAY 2, 1865.

Prof. E. B. Andrews, of Marietta, Ohio, says: "I know of two wells not more than thirty feet apart, in one of which the oil is ten deg. lighter than that in the other. The deepest well had the heaviest oil. The deepest well also contained fresh water, while the water in the more shallow one, was salt. These facts conclusively prove that the oil is found in independent fissures, and not in any horizontal reservoir, nor in any one stratum of rock."

B. F. Stevens, of Trafalgar Square, London, claims to have discovered three new and important uses of petroloum:

1. He claims a patent for the use of the vapors of coal oil, and coal tar, as chemical agents in coloring, etc.

2. As an agent for roasting and smelting ores by the ignited vapors of coal oil mixed with air and steam.

3. He claims to have obtained a strong motive power by the vapors of this oil, mixed with certain proportions of air and steam.

A company of gold miners was recently formed in Melbourne, for the purpose of actually working a mine in the city itself. The incredulous inhabitants ridiculed the idea, and the deeper the shaft was sunk the lower the shares of the company fell. Suddenly, however, the city was surprised by the announcement that the miners had found gold and in paying quantities. A rush was made to the spot, and there the rich metal was seen in considerable quantities. The municipality have granted the company permission to drive the workings beneath the streets, and now other similar projects have started, so that the ground upon which Melbourne stands will shortly be honeycombed by these busy miners.

OIL IN MEXICO.

A letter from Mexico states:

The interest in discoveries of petroleum continues unabated. Springs of undoubted value have been found at the Huasteca, and at several points in the Department of San Luis Potosi and on the Tampico river, as well as in several places in the valley of Mexico; and even on the Pacific side, on the coast of Jalisco, the unctuous fluid is said to abound. Where it will next turn up is yet to be known, but "prospecting parties" are on the alert for every shadow of an indication. Messrs. Covert, McCune and Poole, American residents of Mexico, have come into possession of some valuable springs, and Mr. William H. Arnoux, representing a number of New York capitalists, has recently left for the United States with important title papers relative to petroleum, almost under the very Halls of the Montezumas. Mr. Covert leaves Vera Cruz by the English steamer for Havana and New York, with equally interesting information, and representing some of the most valuable discoveries yet made in Mexico. The oil is clear and of good quality, and is accessible by navigable streams. Boring is soon to be commenced on a large scale, for which any amount of capital is in readiness. The exclusive right to refine this oil, which has been granted to some of the above-named parties, makes their monopoly of almost inconceivable value, particularly when it is considered that they have not only the outside world as a market, but some seven millions of Mexican population to supply—a local trade which is every day increasing, and which can defy impertation from abroad.

THIN SHEETS OF IRON.

Brother Jonathan little thought what a hammering stir would be created in the old country when from Pittsburgh he sent that wonderful letter, written on a sheet made from iron, which took no less than 1,000 sheets to make 1 inch in thickness; the dimensions being 8 in. by 5 1-2 in., or a surface of 44 in., and weighing 69 grains. Since then, Wales has been surpassing America, Staffordshire has been surpassing Wales, and Wales again surpassing Staffordshire, till at length Swansea has succeeded in making a sheet of the finest appearance and thinnest that has ever yet been seen by mortal eye, 10 in. by 5 1-2 in., or 55 in. in surface, and weighing but 20 grains—which, being brought to the standard of 8 in. by 5 1-2 in., or 44 surface inches, is but 16 grains, or 30 per cent. less than any previous effort, and requiring at least 4.800 sheets to make 1 inch in thickness! Some one should tell us how many sheets of gold leaf and how many sheets of tin-foil go to the inch, so that the public, who are familiar with these, might form some visible if not tangible idea of what a sheet of iron 4,800 to the inch can mean, says the London Builder.

ELECTRICITY.—Mr. Hamilton, in his work on Asia Minor, observes:

"One of the most remarkable phenomena which I observed in Angora was the great degree of electricity which seemed to pervade everything. I observed it particularly in silk handkerchiefs, linen, and woolen stuffs. At times, when I went to bed in the dark, the sparks which were emitted from the blanket gave it the appearance of a sheet of fire—when I took up a silk handkerchief, the cracking noise would resemble that of breaking a handful of dried leaves of grass; and on one or two occasions I clearly felt my hands and fingers tingle from the electric fluid. I could only attribute it to the extreme dryness of the atmosphere and momentary friction. I did not observe that it was at all influenced by wind; the phenomena were the same, whether by night or day, in wind or calm. Not a cloud was visible during the whole of my stay."

NEW APPLICATION OF PHOTOGRAPHY.

We learn from the Photographie News that the fac-simile of a will being required in great haste, leave to photograph it was requested. Permission was granted; but, as the time was winter, the day dull, and the hour late, and as so explosive a preparation as the oxy-hydrogen light could not be allowed among so many important documents, it was believed the permission could not be used. Fortunately, one of those concerned thought of the magnesium light; and by means of three small magnesium wires twisted together, an excellent negative of the will was obtained in seven seconds.

An immense deposit of iron-sand has been discovered on the shore of Lake Huron, near Sarnia. An analysis made by Professor Croft, of Toronto, says the British Canadian, shows it to contain 90 per cent. of an excellent quality of iron. Preparations are being made to work the mine.

A NEW PREPARATION OF PAPER.

Several preparations of paper have lately been made which promise to drive iron out of use for plating ships of war; but the last announced is the most remarkable. Very thin sheets are dipped in the oriental gum, called zopissa, and then put together. Plates of this paper, an inch thick, are bullet proof, impervious to water, indestructible by insects, incombustible, and have the advantage of being lighter than any known substance possessing these qualities.

☞ We should have printed in our list of officers of the Philadelphia Gas Works, Joseph Manuel, Esq., as Chief Engineer, instead of "Joseph Emanuel"—but the gentleman being so universally known, the mistake was undoubtedly observed by our readers.

Be courteous of gesture, and affable to all men, with diversity of reference according to the dignity of the person There is nothing that winneth so much with so little cost. He who endeavors to please must appear pleased; and he who would not provoke rudeness must not practice it.—*Sir Philip Sidney.*

IMPORTANT NOTICE.

TO ADVERTISERS.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look hrough our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

PETROLEUM REVIEW.

April 17,—A fair business was done, and prices are a shade firmer; sales of 800 bbls. Crude at 35 cts. 300 bbls. Refined in bond at 53 cts., and 100 bbls. Refined, free, at 73 cts.

April 18,—There has been only a moderate business doing during the week; prices have fluctuated considerably, but at the close are firm; our quotations show an advance of fully 2 cts. per gallon on Refined in bond. At the close the market is extremely firm, owing to the small stock; a fair business is doing; we quote at 35½ to 36 cts. for Crude; 52 to 53 cts. for Refined in bond, and 72 to 73 cts. for do. free.

April 21,—There has been a moderate business today, prices have advanced and are firm at the close at 36½ to 37 cts. for Crude; 52 to 53 cts. for Refined in bond, and 71 to 72 cts. for Refined, free; the receipts to-day are 2,406 bbls.

April 22,—The market continues firm, but the business is moderate and confined to small parcels. We quote Crude at 37 to 37½ cts. Refined in bond, 52 to 53 cts. and do. free, 72 to 73 cts.

April 24,—The market rules very firm, but the business is only moderate; we quote at 37 to 37½ cts. for Crude; 52 to 53 cts. for Refined in bond, and 72 to 73 cts. for Refined free.

April 26,—Crude has been in fair request, but there is no particular change in prices; sales at the close at 37 to 37½ cts. Refined has ruled quiet but full prices were obtained. We quote at 52 to 53 cts. for bonde d, and 72 to 73 cts. for free.

April 27,—Crude has been in fair request, but there is no particular change in prices; sales at the close at 37 to 37½ cts. Refined has ruled quiet but full prices were obtained; we quote at 52 to 53 cts. for bonded, and 72 to 73 cts. for free.

April 29,—Crude is in fair demand and firm; sales of 500 bbls. at 39 to 40 cts. Refined has advanced to 55 to 56 cts. for bonded, and 75 to 76 cts. for free.

May 1,—Crude is easier and nominal at 38 to 39 cts. Refined are heavy at 53 to 54 cts. for bonded, and 73 to 74 cts for free.

NEW YORK MINING EXCHANGE.

NEW YORK, May 1, 1865.

	Bid.	Asked		Bid.	Asked
Copper Stocks.			***Gold Stocks.***		
Aztec	7⅛	9	Benton	1	1⅛
Bedford	1	1⅛	Consol'd Gregory	25	28⅞
Boston	4⅛	5⅛	Corydon	—	3
Caledonia, A. P.	10	12	Gunnel	3⅛	4⅛
Canada	3⅛	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	65	70	Isaac's Harbor	⅜	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls	34⅛	38	Mariposa	44	44⅛
Clifton	—	81	Montana	⅛	1
Dacotah	—	5⅛	New York	2⅛	3
Derby	⅞	1⅛	N. Y. & Nova Scotia	⅛	1⅛
Douglass	—	—	Quartz Hill	9⅛	10
Evergreen	18⅛	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13⅛	Rocky Mountain	—	10⅛
Frue	2⅛	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	13⅛	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	32	33	Cumberland	61	62
Indiana	8⅜	9⅛	Del. & Hud. Canal	206	208
Isle Royale	20	20⅜	*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	⅝	⅞
Mendota	—	—	Clute	1⅜	1⅞
Merrimac	4⅜	5⅜	Erie	—	20
Minnesota	33	37	Macomb	3⅛	5
New York, A. P.	2	3⅜	Plancentia Bay	1⅜	1⅝
N. J. Consolidated	4	4⅛	Sussex	⅝	⅞
Norwich	—	6	Wallkill	3⅜	6
Ogima	5	6⅛			
Ontonagon	3	4⅛	***Iron Stocks.***		
Penn	—	11⅜	Copake	8	10
Providence	1⅜		French Creek	⅜	1
Quincy	96⅛		Teal Lake	4⅜	6
Reliance	1⅛				
Rockland	12⅜		***Miscellaneous.***		
Superior	8⅜		Rutland Marble	17	20
Sharon Consolidated	—		* *Ex. div.*		

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As Superintendent of Gas Works, by an experienced and capable Gas Engineer, who will give satisfactory references as to his integrity and ability. He has had six years practical experience in the management of Coal and Resin Gas Works. Address,

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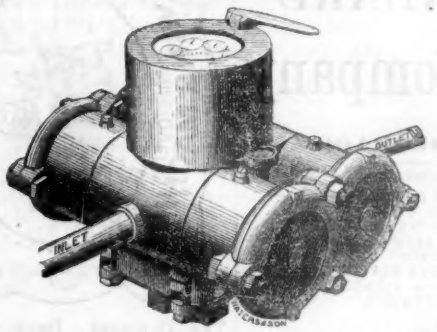

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VASES, FOUNTAINS, STATUARY, ARBORS,

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Wire, Cast Iron and Bronze Railings,

For enclosing Lots, Public Squares, &c.

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The largest variety in the United States.

STABLE FIXTURES,

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Opposite St. Nicholas Hotel. [127

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TRAINS LEAVE FROM FOOT OF CHAMBERS STREET, via PAVONIA FERRY:

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Manufacturers and dealers in

Chandeliers and Gas Fixtures.

Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced prices, in view of the recent fall in gold. Their

Glass and Fire Gilt Chandeliers, are of entirely new designs,

And well worthy of attention by those who wish to purchase

☞ *Fine Fixtures for their Houses.*

They also offer a fine collection of

Real and Composition Bronze Clocks, Mantel Setts and Figures, Parian Statuary, Sterling Silver and Plated Ware, French, China, and English Stone Ware, Dinner, Tea & Toilet Setts, Glassware, Mirrors and Cornices.

☞ All Imported goods sold in conformity with the price of gold.

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WATER AND GAS PIPE.

The Boston Bituminized Pipe Company,

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From the testimonials received, and the entire satisfaction it has given those having it in use, we feel warranted in claiming for this pipe over that of any other, the following advantages, viz.:

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As a GAS PIPE, we say it has no superior. The Lowell Gas Light Co., purchased and laid some of this Pipe last year, and have likewise subjected samples to a test of four month's duration in their dry lime purifiers, with the most satisfactory results, in fact establishing beyond a doubt, its perfect adaptation to the wants and requirements of Gas Companies, specimens of which, together with the statement of O. E. Cushing, Esq., Agent Lowell Gas Light Co., who made these experiments, I shall be pleased to show, and give all other needed information, by applying in person, or by letter, to JOHN L. WEBSTER, Treas.,

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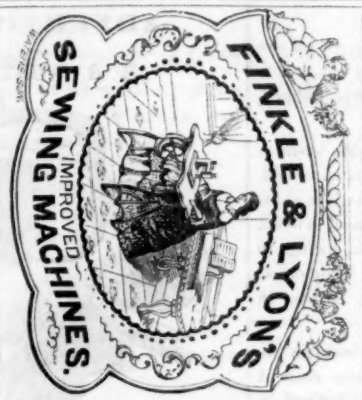

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A CURIOSITY WORTH SEEING!

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They require no instruction to operate perfectly, except "the printed directions."

No change in sewing from one kind of goods to another.

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Our NEW MANUFACTORY is now complete, with all its machinery and tools entirely new, and is already rapidly turning out Machines which for BEAUTY and PERFECTION of FINISH are not surpassed by any manufacture in the world.

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IT IS THE ONLY RELIABLE
Self-Adjusting Wringer.

No Wood-work to Swell or Split. No Thumb-screws to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

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That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog-wheels, will *not tear the clothes.*

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That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, such there be; and we say to all, *test* Putnam Wringer. Test it *thoroughly* with *any* and *a* others, and if not entirely satisfactory, return it

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydise or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,
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NEW YORK, *January*, 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any*, to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
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Estabished 1854.

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By W. B. DISSMORE, Prest.
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Sewer Pipes extensively used in Brooklyn, and now introduced in New York, Jersey City, Newark, Hartford, Albany, and other localities, from 3 to 24 inches in calibre.
Water Pipes, lined and coated with Cement mortar, ready for laying and back filling, and can be tapped like cast-iron pipes, which they excel in durability, discharge, and economy.
Factory Cor. Bond & Union sts., Brooklyn.

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PATENT
NON-FREEZING & NON-EVAPORATING FLUID,
For Filling Wet Gas-meters,
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Far Cheaper than any other Meter-fluid in use.
WARRANTED
Not to corrode tin, iron, brass, zinc, or drum-metal.
To be less injurious to wet meters that water.
Not to freeze at 20 degrees below zero, Fah.
Not to evaporate when in use in the meters meters once filled with it requiring no further attention whatever for years.
The summer is the proper time to fill them.
SIX YEARS OF SUCCESS!
Five years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend our patent with perfect confidence.
For information and references, apply to
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SAVING OF FUEL TO PARTIES USING STEAM DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms of flexible vessels of any kind. Clark's Patent Steam and Fire Regulator Company, No. 5 Park Place, New York.

R. D. WOOD & CO.,
MANUFACTURERS OF
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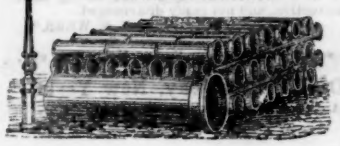

THE AUBIN GAS-WORKS COMPANY,
Of Albany, N. Y.,

Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.
Many Village Gas Companies can be referred to.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
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To Manufacturers of Petroleum Gas.
For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.
Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

GLYCERINE
FOR
Filling Wet Gas-Meters
Cheaper than Whisky Or any OTHER SUBSTANCE,

We have furnished the Cincinnati Gas and oke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.
We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.
HARTMAN & LAIST,
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Great Improvement
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Sewing Machines.
EMPIRE
SHUTTLE MACHIN!
Patented February 14th, 1860.
alesr oom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.
It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarseat to the finest numbert.
Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

PRICE OF MACHINES,
COMPLETE:
No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2 Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given
Terms, invariably Cash on delivery.
T. J. McARTHUR & CO.,
536 Broadway.

WOODEN PURIFYING TRAYS PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.

The Conically Slotted Solid Wood Tray or sieve was patented 21st October, 1862, and all persons are cautioned against purchasing them of any other person except the subscriber. The following companies are now using these trays.
Manhattan, New York,
Metropolitan,
New York
Albany,
Troy
Brooklyn, L. I.
Williamsburgh,
Citizens
Baltimore, Md.
Louisville, Ky.
Chicago, Ills.
Cambridge Mass
And numerous others
Orders received by mail or otherwise.
JOHN L CHEESMAN.
147 Avenue C New York City

NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER, office 56 Goerck street, corner Delancy street, New York.
Gas Retorts, Tiles and Fire-Brick of all shapes and sizes. Fire Mortar, Clay, and Sand. Articles of every description made to order at the shortest notice. B. KREISCHER.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty third streets, Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of Fire-Brick, Gas-House Tiles, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notic

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.
J. D. WEST & CO.,
179 Broadway, N. Y.

WORTHINGTON'S Steam Pumps, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.
Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.
Patent GATES, for Water and Steam-stops.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y

WILCOX & GIBBS SEWING MACHINE
It is entirely noiseless.
A patented device prevents it being turned backward.
The needle cannot be set wrong.
It received the Gold Medal of the American stitute in 1863.
InSend for a circular containing full information, notices from the press, testimonials from those using the machine, &c.
JAMES WILLCOX,
Manufacturer, 508 Broadway, New York
Principal Offices:
New York—508 Broadway.
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Philadelphia—715 Chestnut street.
Chicago—133 Lake street.
Cincinnati—70 West 4th street.
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Hamburg—44 Hermann street.
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TO GAS COMPANIES.
THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.
CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works,
417 Walnut st., Philadelphia.

DON'T FAIL TO READ THIS!

COFFEE
COFFEE! COFFEE!

EAST INDIA COFFEE CO.
154 Reade St.,
(Three doors from Greenwich St.,) NEW YORK,
Call universal attention to their
KENT'S
☞ East India Coffee,

KENT'S EAST INDIA COFFEE
Has all the flavor of OLD GOVERNMENT JAVA, and is but half the price; and also that

KENT'S EAST INDIA COFFEE
has twice the strength of Java, or any other Coffee whatever and wherever used by our first-class hotels and steamboats—the stewards say there is a saving of 50 per cent.

KENT'S EAST INDIA COFFEE
is the most healthy beverage known, and is very nutritious. The weak and infirm may use it at all times with impunity. The wife of the Rev. W. Eaves, local minister of the M. E. Church, Jersey City, who has not been able to use any coffee for fifteen years, can use

KENT'S EAST INDIA COFFEE
three times a day without injury, it being entirely free from those properties that produce a nervous excitement.

Dr. JAMES BOYLE, of 156 CHAMBERS ST., says: "I have never known any Coffee so healthful, nutritious, and free from all injurious qualities as

KENT'S EAST INDIA COFFEE.
I advise my patients to drink it universally, even those to whom I have hitherto prohibited the use of Coffee.
The PRINCIPAL OF THE NEW YORK EYE INFIRMARY says: "I direct all the patients of our Institution to use, exclusively,

KENT'S EAST INDIA COFFEE,
and would not be without it on any account.

The Rev. C. LARUE, an eminent clergyman of the M. E. Church, now stationed at Halsey street, Newark, says of

KENT'S EAST INDIA COFFEE,
"I have used it nearly a year in my family, and find it produces no ache of the head or nervous irritation, as in the case of all other Coffees. It is exceedingly pleasant, and I cordially recommend it to all clergymen and their families."

KENT'S EAST INDIA COFFEE
is used daily by the families of Bishop Ames, Bishop Baker, Bishop James, and many of the most distinguished clergymen and professional men in the country."

Beware of Counterfeits!
and be sure that packages are labeled
KENT'S EAST INDIA COFFEE
154 Reade Street, New York,
as there are numerous counterfeits afloat under the name of "Genuine East India Coffee," "Original East India Coffee," etc., put forth by imposters to deceive the unwary.

In 1 lb. packages, and in boxes of 36, 60, and 100 lbs., for Grocers and large Consumers. Sold by Grocers *generally.*

Orders from Country Grocers solicited, to whom a very liberal discount will be made.

Wholesale Agents: Hoefish & Molan, and W. J. Heiss & Bro., Philadelphia; Francis H. Perry, Providence; A. L. Waite & Co., Boston; Pynchon & Lee, Springfield, Mass.; S. N. Callender, Buffalo; Gordon McMillan & Co., Cleveland; A. A. Colter & Co., Cincinnati; J. & J. W. Bunn, Springfield, Ill.; H. B. Shields, Corydon, Ind.; and C. C. Gerber, Chicago.

The Am. Adv. Agency, 308 Broadway, N. Y., will receive orders for the above named Coffee.

Business Dep., E. ALVORD. | *Corresp. Dep.,* FOWLER & WELLS.

GROVESTEEN & CO.,

PIANO-FORTE MANUFACTURERS.

499 BROADWAY, NEW YORK.

The attention of the public and the trade is invited to our New Scale Seven Octave Rosewood Piano-Fortes, which for volume and purity of one are unrivalled by any hitherto offered in this marked. They conain all the modern improvements, French, grand action, harp pedal, ron frame, over-strung bass, etc., and each instrument being made under the personal supervision of Mr. J. H. Grovesteen, who has had a practieal experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"

Received the highest award of merit over all others at the Celebrated World's Fair!

where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and ilver medals from both of which can be seen at our warerooms.

By the introduction of impro ements we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1, Seven Octave, round corners, Rosewood Plain Case, $275.
No. 2, Seven Octave, round corners, Rosewood Heavy Moulding, $300
No. 3, Seven Octave, round corners, Rosewood Louis XIV, style $325, a fac-simile of the accompaning cut.
TERMS—NET CASH, IN CURRENT FUNDS. Descriptive Circular sent free.

LILLIE'S

CELEBRATED

Chilled and Wrought Iron Safes,

WROUGHT IRON FIRE-PROOFS,

LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought Iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually protected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is an important advantage gained to the purchaser, as Safes often rust out and become worthless in two or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS

	Outside.			Inside.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.

LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

	OUTSIDE.			INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54⅛	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42⅛	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31⅛	27½	15	350

Single Doors and M. Lock.

6	38	35	26	27⅛	23½	15	$250
7	34	31	26	24	21	14	200
8	31	28	24	21	18	13	175
9	30	24	24	21	15	12	140
10	26	22	22	19⅛	13½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES.

SIDE BOARD	.....	$600
DINING ROOM	.....	350
PANTRY (No. 1)	.....	275
PANTRY (No 2)	.....	150
DUODECAGON BANK LOCK	.....	100
MONITOR SAFE	do.	50
SAFE	do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

	OUTSIDE.		INSIDE.			
No.	Height.		Hei	Width.	Depth.	Price.
	In.		In.	In.	In.	
1	68		55	39	18	$1,200
2	61		48	39	18	1,050
3	57		42⅛	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	48	20	$1,000
0½	61	53	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	53	32	26	49	28		
3	42	36	22	38	32	19	00
4	36	31	20	32	27		0
5	30	24	18	26	20	14	

BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjustable.	Price.	Weight.
	In.	In.	In.		
1	72	27	20	$400	3,000
2	72	27	20	275	1,500

Orders received and filled at net cash prices, by the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York. All Safes shipped from Troy free of cartage.

Business Depart., E. ALVORD. *Corresponding Depart.*, FOWLER AND WE

WEST'S IMPROVED PUMP.

Anti-Freezing, Double-Acting, Forcing, and Lifting

These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

THE BEST!

by CAPTAIN ERICSSON and other eminent engineers. We can refer to thousands using them, a guarantee that all will recommend them. They are more simple in construction, and work easie and cost less than all others.

"Our dera will find the double acting, improved pump of J. D. West & Co., one of the best in the market. It is very simple, works to a charm, so that any child may use it; throws a steady continuo us stream, and does not freeze in the coldest exposures, and is unusually cheap. We sa this know ingly, and give the testimony of our own accord, without the knowledge or request of the proprietor "—*New York Evening Post, July 1st*, 1863.

"J. D, WEST & Co.: We are pleased to state that the Pumps we had of you about a year ago, have been in constant use, twelve hours each day, and raise for the use of our woolen factory, about 130 gallons per minute. They work with but little power, compared with pumps we have used before, and do not get out of repair, and are satisfactory in all respects.

"DUNLAP MANUFACTURING CO."

Solon Robinson to the Farmers' Club. Jan. 23.

"No farmer who owns a well or cistern can possibly afford to be without an iron pump. It should be a once a suction and force pump—a perfect little fire engine—such a one known as 'West's Improved Pump.' I speak of this Pump because I happen to know it... to be very simple, durable, powerful and cheap, and it don't freeze up, nor get out of order once a year....I know this, and think I may be doing the farmers good by speaking of it... A boy ten years old can work it, and throw a continuous inch-and-a-quarter stream....It can be made to work in deep wells as well as ni shallow ones."

"GREAT NECK, L. I., 1860.

"I have used this Pump for one summer and winter, exposed to the northwest wind coming over Long Island Sound, being the coldest possible exposure, and at no time did it freeze, nor were we unable at any time to pump water with great ease.

H. B. MC ILVAIN."

"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

"WARREN LELAND, Met. Hotel, N. Y.
"J. W. POMEROY, Yonkers, N. Y.
"JOHN MESSEREAU, N. Y.
"DOMINICK LAWRENCE, Westchester."

From the New York Observer.

"We have had in use for months past one of West's Pumps, which has given us more satisfaction as a force and lifting pump than any we have ever used. It is one of great power, and well adapted for ship's decks, mines, factories, greenhouses, graperies, etc. *The Mining Chronicle and Railway Journal* says: 'It is recommended for its extreme simplicity of construction, great strength, and consequent durability and cheapness of repair. There is no stuffing-box—the pressure being held by a cup packing, like that upon the working-piston, working in a cylinder, fitted for the purpose within the upper air chamber—which we think a great improvement, as stuffing is so liable to be deranged and leak under strong pressure, to say nothing of the loss by friction incident thereto. It has also two air-chambers; thus the action of the valve is cushioned upon both sides by air—preventing water-hammer and vacuum-thump. The valves are very accessible and simply and cheaply repaired. They work much easier than any pump we have ever seen; the 4-inch cylinder being worked by children in wells 100 feet deep, and as they are extremely cheap, as well as simple and strong, we freely recommend them.'"

"CAMBRIDGE MINE, N. C., June 15, 1863.

"J. D. WEST & Co.—Gents: The Pump which I ordered for our mine is received, and put to work in our underlay shaft, which we are sinking. We find that one man will, with ease, lift 50 gallons per minute. We lifted in three and a half hours all the water in the shaft, which measures seven by twelve feet and thirty feet deep, and it was full when we commenced. It answers our expectations in every respect, and our workmen are highly pleased with it. It will do great service with but trifling expense for repairs.

"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'West's Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly at work, 24 hours of each day (save Sundays), and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

We have plenty more such certificates, but think these are enough. For Pumps, Hose, Pipe, etc., address or call upon

J. D. WEST & CO., 179 Broadway, New York.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,
No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	84	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	89	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8¼	5 00
35	10	8 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by returning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 36 Dey Street, N. Y.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Doane st., Boston.

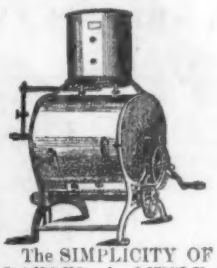
GEO. H. KITCHEN & CO.,
NEW PATENT
GAS APPARATUS
For Country Residences, Public Buildings, &c.,
FROM $300 UPWARDS.
EVERY DESCRIPTION OF GAS FIXTURES.
Gas Fitting in all its branches.
561 Broadway,
NEW YORK.

SCHMIDLIN & DRISCOLL,
MANUFACTURERS OF
HALL, STREET & CHURCH LANTERNS,
Show Window and Street Lamp Reflectors,
135 Mercer Street,
NEW YORK.

LAFARGE, & CO.,
BROKERS,
4 WALL ST., (2d floor) NEW YORK,
STOCKS, BONDS,
AND OTHER SECURITIES
Bought & Sold.
ON COMMISSION.
LAFARGE, G. I. GERRARD

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

DRAKE'S
PATENT
AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient, Simple, and Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas-works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

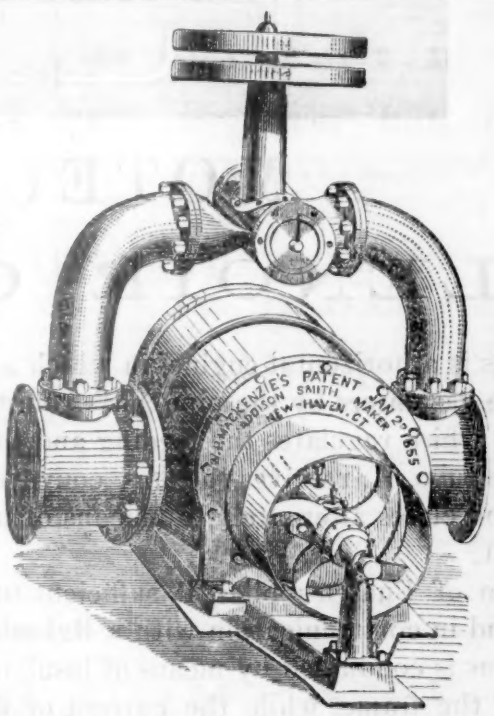
These Machines are manufactured in Boston, by the AU OMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington s eet, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broadway, New York

For further particulars, address—

MITCHELL, VANCE & CO.,
620 BROADWAY, NEW YORK CITY.

THE MACKENZIE PATENT GAS EXHAUSTER AND COMPENSATOR.

SMITH & SAYRE,
Sole Proprietors and Manufacturers of



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the tion and illuminating power of the gas, and add very much to the durability of the retorts, c clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, dur cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the p er required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel. Address SMITH & SAYRE. 458 Broadway, New York.

MORRIS, TASKER & CO,
PASCAL IRON WORKS,
[ESTABLISHED 1821,]
PHILADELPHIA,
Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works.; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
STEPHEN MORRIS,
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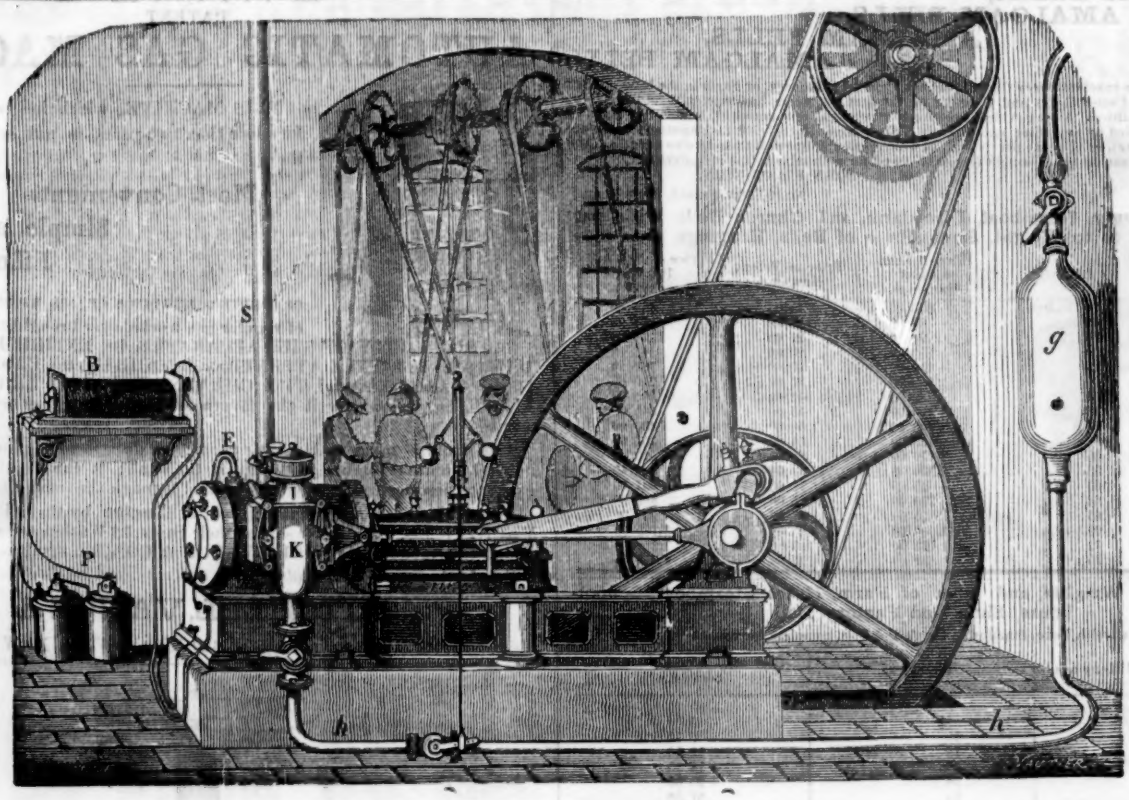
SOUTHWARK FOUNDRY,
FIFTH & WASHINGTON STREETS,
PHILADELPHIA.
MERRICK & SONS, Engineers,
MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.
Retorts, Bench Castings, Condensers, Washers, Surubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
24th and Washington Streets, Philadelphia



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the Dry Dock Iron Works, No. 435 East Tenth street, near East River, New York, where they are being manufactured, and those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

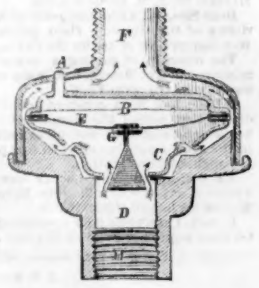
It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK

NOTICE TO GAS COMPANIES AND GAS CONSUMERS

THOMPSON'S PATENT GAS CONTROLLER

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to science.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of from five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas-light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to the public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SANDS, Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "
GEO. H. KITCHEN, Inspector of Gas Meters, N. Y.
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the Office, 111 Pearl street, where they can see the operation by pressure guage and test meters

M. L CALLENDAR, Agent
Office, 111 PEARL STREET.

THE AMERICAN METER CO

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER.

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durab ility, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

512 WEST TWENTY-SECOND STREET, NEW YORK,
ARCH AND TWENTY-SECOND STREETS, PHILADELPHIA,
No 23 WEST STREET, BOSTON, will meet with prompt attention.

HARRIS & BROTHER, PRACTICAL GAS METE MANUFACTURERS,

Continue, as heretofore, at their old Establishment, **No. 1117 CHERRY ST., PHILADELPHIA,** to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicited, and promptly attended to by

HARRIS & BRO., No. 1117 Cherry st., Phila.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality; the number furnished by you to these works is over 5,000.

JOHN C. CRESSON, Engineer.

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of workmanship and accuracy of registration; they are surpassed by none, and equalled by few manufactories in the Union; we have used meters made by other establishments, but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. HOOKEY, Superintendent of the Gas Light Company of Augusta, Ga,

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, BIRKINBINE & MEARS.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory and take pleasure in expressing my opinion a to their correctness. On several occasions I have taken your meters apart, and found the materials used in the manufacture of the same to be as fine quality as is used in those imported from Europe, or made by any of the manufacturers in the United States.

Respectfully Yours, GEORGE WIEGAND,
Inspector of GasFittings, Philadelphia Gas Works

Glycerin for Gas Meters.

This article is superior to any fluid ever before used for Wet Meters, and we cannot better set forth its advantages than by giving the following letter from the Superintendent of the Co ington Gas Co. The superiority of our Glycerin over all others in the market, for this purpose, is admitted by every Company that has used it. We have sold, the past winter, to the Cincinnati Ga -Light and Coke Co.; to the Gas Companies of Covington, Ke.; Dayton, Springfiel , Portsmouth, Urbana, and Piqua, Ohio Richmond, Ind., and Buffalo, N. Y, to whom we refer.

Glycerin is much cheaper than Whisky is now, or likely to be ar eafter, and not evaporating, greatly increases the economy of vs use.

OFFICE OF THE COVINGTON GAS-LIGHT CO.
COVINGTON, KY., Feb. 18, 1864.

MESSRS. W. J. M. GORDON & CO.:

Dear Sirs,—It affords us great pleasure in testifying to the superiority of the Glycerin Fluid purchased from you for filling the Wet Meters now in use by the Covington Gas-Light Company.

The difficulty of finding a non-evaporating and anti-freezing mixture for Wet Meters, has, in my opinion, been overcome by the use of your Glycerin Fluid.

I have had it in constant use for the past four months, and during that period the thermometer has ranged as l ow as 14o below zero, and after careful examination, I have found the fluid in the same condition as when first put in the Meters, and without the slightest discoloration.

Its non-evaporating quality does away with the hitherto una voidable expense of filling the Meters monthly, and renders Wet Meters no longer objectionable.

In fact, I can cheerfully recommend it as being cheaper and better than any other Fluid or Mixture now in use.

Very respectfully,
S. S. STRATTON, *Sup't Cov. Gas Co.*

We have been engaged in Manufacturing Glycerin the past six years, and from our advantage in materisl and the large amount we make, are enabled to offer it lower than any manufacturer in this country. We will be pleased to quote prices or to give further information.

W. J. M. GORDON & BRO.,
MANUFACTURING
CHEMISTS & DRUGGISTS,
N. E. Cor. Central Avenue & Eighth St.,
Laboratory, Miami Canal, bet. Third & Fifth Sts.,
CINCINNATI, O.

BROWN'S

PATENT BABY TENDER.

THE BABY-TENDER.

Is the most complete and useful Nusery Invention of the age. From a charming Spring Cradle, it is easily and almost instantly converted into either of the following articles namely:

A Reclining Couch, for children to young to sit alone.
A Spring Chair.
A Baby Walker, attractive and useful.
An Ottoman, for the parlor or dining room.
A Hobby-Horse, for children under five years.
A Baby-Jumper, for security, exercise and amusement. (See cut)
A Baby-Horse, or, when elevated,
A High Chair, for the table.
A Nursery Chair.

The motion of the Baby-Tender, which is vertical and noiseless, is derived from a Spiral Spring in the Ottoman; and, unlike that of the common Rocking or Swinging Cradle, is in the highest degree healthy, delightful and soothing. It relieves the mother from the hardest part of baby-tending.

Prices from $25 to $50.

AGENTS WANTED.

Terms cash.

When packed the Baby Tender alone measures seven cubic feet, and weighs about one hundred pounds. The horse adds about one-fourth to the weight and measurement.

☞Send for Descriptive Catalogues.

BABY-TENDER MANUFACTURING COMPANY.
939 Broadway, N. Y.

New York, April 18th, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation*, for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co, Sole Proprietors.
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants of an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitterz, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy o keep in the house.—*New York Weekly Day Book.*

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BY GAS.

CHEAPER THAN COAL OR WOOD.

The "EAGLE" Gas Heating
STOVES,

Positively guaranteed free from Smoke or Smell.

Will Heat Offices, Parlors, Dining, Sleeping, and Bath Rooms. Also,

The EAGLE Gas Cooking
STOVES & RANGES,

Will BOIL, BROIL, ROAST, BAKE, TOAST,

STEW, and HEAT IRONS

The EAGLE GAS STOVES and RANGES have been in use for over Three years, and are found to be the most SIMPLE, COMPLETE and PERFECT Arrangment for HEATING and COOKING, in every respect, ever invented, and to do the Work with LESS TROUBLE, in LESS TIME and at LESS EXPENSE than any Coal or Wood stove.

Their WONDERFUL NEATNESS, CONVENIENCE and ECONOMY can be seen at a glance.

WE ALSO MANUFACTURE

COAL OIL STOVES,

For Cooking and Heating.

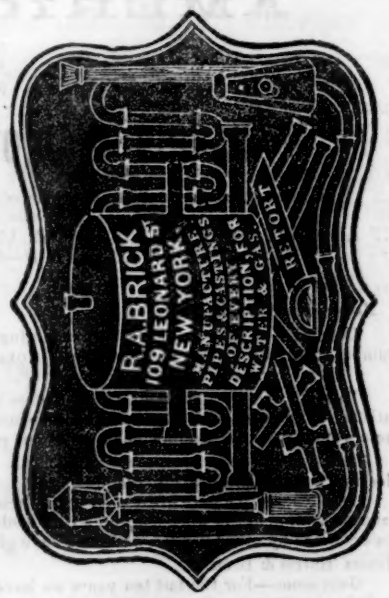
The American Advertising agency 389 Broadway, N Y. Bus. Dept., E. Alvord, cor. Dept., Fowler & Wells, receive orders for our stoves.

EAGLE GAS STOVE MANUFACTURING CO.
No. 474 BROADWAY, N. Y

☞The Company have descriptive Catalogues, which will be sent or delivered, upon application for them.

PIPES AND CASTINGS,

BERGEN IRON WORKS,



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